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# USSR Report

ECONOMIC AFFAIRS

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## USSR REPORT ECONOMIC AFFAIRS

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## ECONOMIC POLICY, ORGANIZATION AND MANAGEMENT

### NEW DIRECTION FOR ECONOMY SET AT JUNE CONFERENCE

Moscow PLANOVYE KHOZYAYSTVO in Russian No 8, Aug 85 pp 3-8

[Editorial: "Decisive Direction in the Development of the Economy"]

[Text] The conference on questions of the acceleration of scientific-technical progress, which was held in June at the CPSU Central Committee, is of great importance for determining the immediate and remote prospects of our country's economic and social development. At that conference there was a consideration of the vitally important problems of the further growth of the productive forces and the improvement of the production relations of developed socialism. The conference became an important link in the work of fulfilling the decisions of the April 1985 Plenum of the CPSU Central Committee and the preparation for the 27th CPSU Congress.

Communist Party members and the rest of the Soviet citizens gave warm approval and support to the scientifically substantiated concept that was expounded in the report of General Secretary of the CPSU Central Committee M. S. Gorbachev on the basis of a realistic evaluation of the state of affairs -- the concept of the acceleration of our country's socioeconomic development and the qualitative transformation, on the basis of the introduction of modern scientific achievements, of the material-technical base of the national economy, and the improvement of administration.

At the conference, mention was made of the outstanding achievements in the area of economic construction, of which the Soviet nation is rightfully proud. During the years of the three most recent five-year plans alone, our country built thousands of enterprises; there was a substantial change in the outward appearance of cities and villages, and a considerable rise in the level of culture, education, and public health. Much was done to improve the housing, cultural, and everyday living conditions and, as a whole, the material welfare of the nation.

At the same time, since the beginning of the 1970's definite difficulties have begun to be felt in economic development. The reason for those difficulties was that there had been no prompt manifestation of persistence in the reorganization of the structural policy, the forms and methods of administration, or the very psychology of economic activity.



The task being advanced is that of overcoming the negative tendencies, of turning the job at hand sharply toward the better, and guaranteeing the acceleration of our country's socioeconomic development on the basis of scientific-technical progress. We have in mind not simply an increase in the growth rates of the national economy, but a new quality of its development, its rapid forward movement along the strategically important directions, and the fundamental structural reorganization of production, the economic mechanism, and the system of administration.

The resolution of the questions of scientific-technical progress is linked with national-economic planning, with the raising of the scientific level of the plans for economic and social development, and with the improvement of the work of the planning agencies in the center [Moscow and Leningrad areas] and in the outlying areas. It is necessary to carry out a fundamental reorganization of planning activity as a whole in conformity with the requirements of the day.

A problem of exceptional importance is the acceleration of the rates of technical re-equipping of all branches of the national economy, the reorientation of every branch, every enterprise, and the entire national economy toward the intensive method of development. The intensification of the economy is based on that reproduction mechanism which reflects to the greatest degree the latest achievements of science and technology. Under present-day conditions that intensification occurs in the most progressive, most revolutionary forms. Taking this into consideration, the CPSU Central Committee orients the production cadres toward guaranteeing the mass manufacture of technology in new generations, which is capable of providing a many-times increase in labor productivity and of opening up the path to automation.

An area that is becoming a major one in our development is the upsurge of machine-building, and the catalyst branches of modern scientific-technical progress -- microelectronics, computer technology, instrument-building, and the entire informatics industry. The key role in the technical re-equipping of the national economy is assigned to machine-building. It must receive priority development. It is necessary to develop specialization and cooperative actions, and to achieve a considerable rise in the technical-economic level of machine-building output.

The broad and mass replacement of obsolete equipment in the machine-building branches requires the rapid development of machine-tool-building, and the improvement of the quality and expansion of the structure of the machine tools being produced. Experience that deserves attention in this regard is that which was accumulated by the Ivanovskiy Machine-Building Production Association imeni 50-letiya SSSR, which, by the end of the current year, will produce, in excess of the five-year plan, output valued at more than 50 million rubles and will deliver 110 processing centers. The association's output is steadily in demand on the world market.

During the present critical period, when the party is approaching the 27th CPSU Congress and the preparation of the keynote documents for the congress is under way, as Comrade M. S. Gorbachev noted in his report, it is important to

be aware that we cannot do without the acceleration of scientific-technical progress. And therefore all those documents, but primarily the Basic Directions of the Country's Economic and Social Development During the 12th Five-Year Plan and Until the Year 2000, must specify new approaches that guarantee a sharp turning toward the intensification of the economy. It is precisely intensification that must become the basis for the realization of the broad social programs, for the increasingly more complete satisfaction of the growing material and spiritual needs of Soviet citizens, and the reinforcement of our country's defense capability.

It will be necessary to bring science and production closer together and to remove all barriers that are preventing that -- economic, organizational, and psychological. The production and scientific cadres must understand the necessity of reorienting our country's economy toward the path of intensive development.

The achievements of scientific-technical progress are realized in the process of capital construction. The degree of effectiveness with which the process of the technical re-equipping of production and the remodeling of enterprises are carried out, and the degree of timeliness with which the new production capacities are activated, determine the economic indicators of production, the technical level, and quality of the output being produced.

At the conference, emphasis was made of the necessity of reorganizing investment and structural policy. The chief emphasis must be placed on the technical re-equipping of the enterprises, the return on which is approximately twice as high as the return on new construction. It is important to overcome the management stereotype that has developed, in which the factor that was considered to be the basic method for increasing production was new construction, whereas many enterprises that were constructed long ago received no technical re-equipping for long years, everything possible was squeezed out of them, and very little was invested in them. It is precisely for this reason that today a considerable amount of the production assets are obsolete, and this has been causing an increase in the costs of operating and repairing them. There has been an immoderate inflation of the capital-repair sphere. Machine-building ministries show little concern for the repair-suitability of the technology being produced by them. As a result there is a reduction in the return on assets and an increase in the number of work stations, and, in addition, the mechanization of production is being introduced weakly. The share of manual labor is being reduced slowly.

The CPSU Central Committee has assigned the task, within the next few years, of increasing the share of the funds to be channeled into remodeling, in the overall volume of capital investments, from one-third to at least one-half. It has been deemed to be desirable to carry out a complete stocktaking of production assets, and to develop remodeling programs for every enterprise and every branch. The share of removal of obsolete fixed assets, especially in their real part, must be doubled. A task of primary importance is the guaranteeing of that renovation of production that is accompanied by the introduction of the most advanced technology and that provides the greatest economic and social effect.

The realization of these tasks is being hindered by shortcomings in capital construction, which to a large degree nullify the efforts in the area of scientific-technical progress. Not infrequently, the designs themselves include ineffective technical decisions, as a result of which annually a rather large part of them is returned for reworking. One continues to observe the dispersion of capital investments and the excessive dragging out of construction periods. Therefore even the best designs become obsolete in the course of being carried out.

The party's Central Committee has required the introduction of order into the planning and designing of construction, the guaranteeing of the concentration of capital investments and the observance of the normative deadlines for the construction of projects, and the conversion of construction into a single industrial process. The state of affairs in the construction organizations and trusts must be evaluated on the basis of the extent of vigor with which they influence the accelerate the scientific-technical progress. It is proposed to carry out a series of measures to assure the fundamental reorganization of capital construction, its industrialization, and the elimination of the lag in the development of the branches in the production infrastructure. In agriculture the resources must be channeled primarily into the raising of the harvest yields of the fields and the productivity of animal husbandry, the introduction of intensive technological schemes for the cultivation of crops, the improvement of selection and pedigree work, and toward the development of the base for storing, transporting, and processing the output.

The carrying out of the technical redesigning of the national economy will require tremendous capital investments. They must be guaranteed by the compensatory nature of the measures to accelerate the scientific-technical progress, which measures will be carried out in the branches of the economy. However, at first we will not be able to do without the maneuvering of resources, the concentration of them in the key areas. A task of first priority is the introduction of order in everything that the country has at its disposal. In every association and enterprise, at every production sector, it is necessary to determine those links where, with the minimal expenditures or without any expenditures at all, it is possible to obtain the greatest effect. Every Soviet citizen must have a thorough understanding of the fact that economy measures are the path to our wealth, and are truly the task of all tasks. It is a job for the entire party, for the entire nation.

The most accurate and generalizing indicator of scientific-technical progress, culture, and labor discipline is the quality of output. It is precisely quality of output that determines both the growth rates of production and the degree of satisfaction of social needs. During recent years much has been done in this area but, as was emphasized at the conference, the basic work still lies ahead. Quality and the technical-economic level of the articles remain one of the sore spots in the economy, and the source of many difficulties and problems. All this causes serious socioeconomic and moral-political harm. And it is completely inadmissible that the newly created technology, while already at the stage of designing, proves to be obsolescent, yields to better indicators with regard to reliability, rated life, and economy. Sometimes output that has been put in the highest category has



parameters that are inferior to the best worldwide models. The party and economic organizations and labor collectives must consider to be a very important area of their practical activity the substantial improvement of the quality of output and operations, the reinforcement of technological discipline, and must make stricter demands on those who, in matters of quality, occupy a passive position, do not manifest persistence with regard to bringing the output up to the level of the highest worldwide achievements, or who reconcile themselves to defective output or violations of the technological schemes in production. The quality of output must be the object not only of professional, but also national pride.

The raising of the technical level and quality is closely linked with our structural policy. In the course of preparation of plans, and especially in the process of realizing them, it is necessary to channel more resources into the development of those branches and individual enterprises that are producing output of skilled labor -- modern machinery, instruments, means of mechanization and automation, and high-grade consumer goods.

Much in the production of modern output depends upon the structure and quality of materials. In this matter we are still falling behind the present-day requirements. It is well known, for example, that the Soviet Union produces more steel than anyone else, but we do not have enough metal. The main reasons are the insufficient quality, the limited variety, and wasteful use. The share of plastics, ceramics, and other progressive nonmetallic materials in their overall volume is still small. Throughout the world there has been a headlong increase in the production of output of products of small-tonnage chemistry, pure and superpure materials, which largely determine the level of modern technology. Therefore it is necessary to double and triple the efforts in order to prevent lagging behind in this area also. The planning agencies, ministries, and departments have been called upon to pay special attention to the development of such production entities as the "fourth reprocessing" in metallurgy and small-tonnage chemistry, and to take all steps to increase the production of modern output from each cubic meter of wood, each ton of petroleum or other chemical raw material.

The ministries and departments, enterprises and organizations have been called upon to guarantee the efficient use of materials and labor and financial resources, and to assure the strictest economy measures and the broad introduction of resource-saving technological schemes. It is necessary to mobilize for these purposes all the economic and social incentives and to reinforce order everywhere.

It is necessary to improve the correlation among the resource-extracting, processing, and consuming branches. The most efficient method is complete economy measures, the broad introduction of resource-saving technological schemes. This proves to be only one-third to one-half as expensive. At the conference, mention was made of the experience of resource saving that exists at Minelektrotekhprom [Ministry of the Electrical Engineering Industry], where

the growth of production of output in the 11th Five-Year Plan is being achieved without increasing the consumption of the basic materials.

In a number of branches of the national economy one observes inadmissibly wasteful methods -- the consequence, on the one hand, of reduced responsibility, and, on the other hand, of the fact that the material base is lagging behind the needs to intensify production. Up to 8 million tons of gasoline overconsumed every year as a result of the lag in converting the motor pool to diesel motors. The imperfection of the equipment at thermal electric-power stations and other causes annual cause the overexpenditure of more than 20 million tons of standard fuel. The press has already written several times about the hundreds of thousands of primitive boiler rooms that are inefficiently expending fuel, but the situation has not changed much. Poor use is being made of secondary resources, and yet resource-saving should be one of the chief areas in investment policy. The task has been assigned to satisfy 75-80 percent of the increased need for fuel and for raw and other materials by means of economizing them elsewhere.

Soviet scientists are acting as energetic participants in the struggle for the acceleration of scientific-technical progress. The successes of domestic science in various areas of knowledge and technical progress are generally acknowledged. Our nation is proud of its achievements in space research, mathematics and mechanics, thermonuclear synthesis, quantum electronics, and a number of fields of biology. Almost every scientific-technical direction has very promising developments at its disposal. At the same time the demands of the national economy and the requirements pertaining to the operation of scientific institutions have been growing. All the links in the single chain which combine science, technology, and production must be reinforced.

The fundamental sciences are of first-priority importance. It is precisely those sciences that act as the generators of ideas, that penetrate into newer and newer fields, and guarantee a high benefit for the national economy. The academy institutes will have to expand their research that has a technical directedness. It is necessary to increase the responsibility for the creation of the theoretical foundations for fundamentally new types of technological schemes.

An important reserve in expanding the scientific potential is science at the institutions of higher learning. Many scientists at the technical institutes of higher learning and at universities are capable of resolving major comprehensive problems. And yet the capabilities of the institutions of higher are not being used completely, although, on the basis of existing estimates, they can increase the volume of scientific-research projects by a factor of 2-2.5.

The party has assigned important tasks to branch science. The scientific-research, design-technology, and design organizations of the branch ministries must be more closely interrelated with production. Therefore it is necessary to include them as part of the associations and enterprises, thus intensifying the plant sector of science. It has been recognized as efficient to create comprehensive interbranch scientific-technical centers as part of the USSR



Academy of Sciences in accordance with the experience of the Institute of Electrical Welding imeni Ye. O. Paton and other scientific institutions.

It is important to give new impetus to the work of developing the network of major scientific-production associations which must become truly the advance posts of scientific-technical progress. This is attested to by the experience of the Kriogenmash and Svetlana associations, and many others. A creative approach was taken there to the establishment of smooth ties between science and production. The Svetlana Association, for association, has created five scientific-production complexes on the basis of the previously independent plants, production entities, and design bureaus. These complexes specialize according to the object principle and bear the responsibility not only for the development of new articles, but also the fulfillment of the plans.

The conversion of our country's economy to a system of intensification requires the reorganization of planning and administration, and the entire economic mechanism. The essence of this reorganization was defined in the decisions and materials of the 26th CPSU Congress, and the November 1982 and subsequent Plenums of CPSU Central Committee. That essence consists in the fact that our country will continue to adhere to the line aimed at the reinforcement and development of democratic centralism and at the increasing of the effectiveness of the centralized principle in administration and planning, with the simultaneous expansion of the independence and the increasing of the responsibility of the enterprises, and the energetic use of more flexible forms and methods of management, cost accountability, and commodity-monetary relations, and the broad development of the initiative of the masses. In this the party sees the well-principled direction of the improvement of the economic mechanism.

The task that is being advanced is the task of making the economy as receptive as possible to scientific-technical progress, and of assuring that all the links in the national economy are vitally self-interested in this. It is necessary to subordinate to the resolution of this task the wide-scale economic experiment in which newer and newer branches of the national economy have been included.

A large amount of attention at the conference was devoted to the work of the planning agencies. As was pointed out in the report by M. S. Gorbachev, it will be necessary, in the real-life situation, to realize the Leninist idea of converting Gosplan into a scientific-economic agency that concentrates major scientists and the leading specialists. The chief place in the plans must be occupied by the qualitative indicators that reflect the effectiveness of the use of reserves, the scope of renovation of output, and the increase in labor productivity.

Fundamental importance is attached to the conference's conclusions concerning the role and place of the State Committee for Science and Technology. It is planned to impose on that agency the responsibility for carrying out the supervision of the scientific-technical level of the branches, the conformity of the production to the best achievements, the formation of a network of NII [scientific-research institutes] and design organizations, and the coordination of scientific-technical activity in the country.

The basic reserves in achieving the highest effectiveness lie at the points where the branches abut, where it is difficult both for USSR and the ministries to select the optimal alternatives. In this regard, in practical activity there arises the question of creating agencies for administering the major national-economic complexes.

Under present-day conditions there have also been changes in the functions of the ministries, and their efforts and attention must be concentrated on long-range planning and wide-scale use of innovations for raising the technical level of production and the output being produced. The task assigned is to achieve a substantial reduction in the administrative apparatus.

The tasks of accelerating scientific-technical progress influence the intensification of the role of the basic production link -- the associations and enterprises. It is precisely the associations and enterprises which must carry out the economic-operations work as a whole and must be directly subordinate to the ministries.

The reorganization of the organizational structure of administration must be organically combined with the intensification of cost accountability and the economic levers and incentives. A mechanism is needed which would guarantee advantages to the collectives acting in the vanguard of economic progress, which would make the production of obsolete output unprofitable, and which would intensify the consumer's effect upon the technical level and quality of the output.

The economic and planning agencies will have to transfer the associations and enterprises to complete cost accountability, will have to reduce sharply the number of centrally established planning indicators, and will have to do everything to assure that their work is regulated by economic standards. It is important to establish a direct dependence between the final results and the payment of labor. The brigade contract must become even more widespread. In many branches it has been recognized as desirable to create consolidated combined brigades. The reorganization of the economic mechanism in our time is an objective necessity.

The fulfillment of these tasks correspondingly predetermines the fundamental improvement of work with cadres. The chief principle espoused by the party is the carrying out, by all means, of a major change in the psychology of the cadres from top to bottom, concentrating their attention on that which is most important -- scientific-technical progress.

Questions that require cardinal improvement are the questions of instructing, indoctrinating, and retraining the engineer-technical and scientific cadres, especially in new specialties. It is necessary to increase the social role of scientific and engineering labor, to guarantee the intensification of the creative principles in that labor, and to take steps to encourage the qualitative fulfillment of the operations with a smaller number of personnel. The planning agencies, ministries, and departments have been called upon to

improve the planning of the training of cadres of specialists with a consideration of the requirements of scientific-technical progress.

The consistent realization of the tasks that were brought up at the conference, the changeover of the economy to a system of intensification, and the wide-scale use of the achievements of scientific-technical progress must become a nationwide, partywide job, and the pivot of the organizing, political, and economic work at all levels.

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## PLANNING AND PLAN IMPLEMENTATION

### ECONOMIST ANALYZES METHODS, LIMITATIONS OF CENTRAL PLANNING

Moscow PLANOVYE KHOZYAYSTVO in Russian No 9, Sep 85 pp 70-77

[Article by Candidate of Economic Sciences A. Buzgalin: "Centralism in Planned Economy: Limitations and Methods"; passages rendered in all capital letters printed in boldface in source]

[Text] One of the basic advantages of socialist economy--centralized planning of development of the national economy--assumes further improvement of forms of its realization. Under contemporary conditions this task becomes complicated by the level achieved in the development of productive forces, which reveal the contradictory nature of their connection with production relations and require improvement of their forms.

The solution of these tasks is substantiated in documents of the April (1985) plenum of the CPSU Central Committee. The materials of the conference at the CPSU Central Committee on questions of accelerating scientific and technical progress also take aim at comprehensive improvement of the entire system of management of the national economy.

In this connection some theoretical positions on the aforementioned questions require additional arguments or clarification and much deeper revelation for the purpose of full utilization in management. Naturally, examination of such an important problem of socialist development could not but cause differences in interpretation of the essence and functions of centralized planning, which affects many other questions, including its limitations and authority of organs of direct address planning.

An analysis of various points of view shows that some of them accentuate attention on the fact that the economic center still does not possess sufficient information on production possibilities and resources (it is concentrated locally) and this has an effect on the quality of adopted decisions. In particular, the shortage of information on requirements and their structure and volume is "covered" by planning from that which has been achieved, whose defects have been known long ago. It prompts enterprises to conceal reserves, set orders for resources too high and use other methods, which hamper intensification of production. Individual publications also note that centralized planning cannot always determine with sufficient completeness the specific requirements of production as well as of personal nature, with which they link the shortcomings



of material and technical supply, the discrepancy between allocated funds for resources and actual requirements and the occurrences of shortage and overstocking, including in retail trade. In this connection it is also stated that the decisions of the Center (by virtue of its remoteness from specific economic processes and insufficient time for developing and adopting decisions) are not always effective and flexible and the mechanism of their implementation is not always free of bureaucratic distortions, which are quite often manifested in management. Finally, the economic center, for example, the USSR Gosplan is capable of drawing up a balanced plan for 5,000-10,000 positions, but the range of products being produced is numbered in millions.

All of this really exists to one or another degree in today's organization of the economy, and there are enough reasons for criticizing the shortcomings being revealed. But the problem today is not so much the criticism of some of other shortcomings, of which much has already been written in the press, as an answer to the question of another scale and content--is it sound from the position of economic science on the basis of these and many other facts to advance proposals on reconsideration of the attitude toward address national economic planning, or maybe even belittling its role and shifting to management on the basis of indirect methods?

In the meantime it has been repeatedly proven in Soviet economic literature that direct address planning (if it is based on balance calculations and coordination of resources and requirements, scientifically substantiated norms and so forth) is an economic process that predetermines the socioeconomic form of distribution of labor, proportions and exchange of activity, which determines the economic content of address tasks that are secured by administrative forms. It was repeatedly noted that the principle of democratic centralism assumes the linking of compulsory centralized decisions and strict discipline of their fulfillment, on the one hand, and democratic procedure of their adoption and general participation of workers in management at all levels, on the other hand. Centralized management on the basis of direct as well as on the basis of indirect methods can suffer from bureaucratic manifestations in realization and, on the contrary, be successful on the basis of democratic forms (depending on how democratic the procedure of adoption and fulfillment of a decision is). It was also stressed that strengthening of independence is a particular problem, even if closely linked with the principle of democratic centralism and in either case not reduced to development of isolation of economic units and development of commodity-money relationship.<sup>1</sup> These sufficiently well known theses are quite often ignored in literature. And this is no coincidence: under conditions of manifestation of elements of departmentalism and naked bureaucratic administration by mere injunction, which distorts the essence of socialist management, many advantages of address planning organization of production come to naught. The inability displayed under these circumstances in some cases of the developed centralized management mechanism to adequately take production and personal requirements as well as resources into account causes intensification of centrifugal tendencies and brings about the appearance of proposals on the growth of independence of economic units (the objective necessity of developing planned operational-economic independence of economic units and a tendency toward their isolation becomes entwined here in a contradictory manner).



The existence of aforementioned shortcomings in the practice of production organization conforming to plan also creates empirical prerequisites for "isolation" of address planning from its economic content and equates it with particularly administrative not economic management. As a result, the objective necessity of strengthening economic principles in management is sometimes interpreted as a synonym of development of commodity-money relationship.

Thus, this approach is not accidental, but its "non-accidental nature," like the the theoretical views corresponding to it, in no way means an objective necessity and economic effectiveness of the conclusions and proposals formed on their basis. The reasons of this lie in the fundamental features of contemporary economics. The fact is that the high level of socialization of production can in some cases result in that a large production association-supplier "sometimes finds itself in a position of a monopolist, without giving its partner... an opportunity of selecting deliveries or rejecting some of them." <sup>2</sup> As a result of the proposal on strengthening the role of the consumer by granting him the right of freely selecting a supplier and thus stimulating production by means of the ruble and the amount of profits is in reality a step in the direction of subordinating the consumer to largest production associations not only from the standpoint of production quality but also with regard to the range of goods, price level and so forth.

If production is oriented primarily not toward requirement as such but toward effective demand, then the balance of production and effective demand on the basis of indirect regulation, which is based on commodity-cost relationship, can be achieved quite easily, but not so much by improving the reproduction structure of the national economy as by changing the price parameters. The demand is balanced with supply, but this in no way means the balance of production and consumption in its natural-physical form. The hidden disproportion which supplements this process will hardly promote intensification of production.

However, intensification of production is a MEANS for solving realization problems of a higher goal of our society's socioeconomic development, which is dictated by the basic economic law. It is precisely here that the greatest shortcoming of the economic system is manifested, which is built on the basis of indirect management methods and intensification of isolation of enterprises --reducing management aims to satisfying effective demand, which does not exhaust the entirety, the essence of the basic law of socialism <sup>3</sup> and signifying PLANNED subordination of social production not only to the growth of well-being, but also to the goal of free, harmonious and all-round development of personality of every member of the society. The latter is implemented, first of all, not in consumption, but in labor, which according to its social form (and then also according to technical nature) becomes a means of self-fulfillment of an individual, his first requirement. In this is the fundamental difference of activity of a worker of a new type from activity of a commodity producer, which is directed at individual appropriation of things.

Realization of the aforementioned task on the path of development of socioeconomic processes will make it possible to solve some fundamental problems. First of all, the formation of requirement in labor creates the most powerful and for communist method of production a specific socioeconomic, that is even if not

expressed in money, but material and not only moral incentive for raising labor efficiency. It is known that organization of management which plans predominance of commodity-cost relationships and indirect methods of regulation is built on quite different socioeconomic incentives. Monetary, physical stimulation of workers is understood almost exclusively under economic incentives. All other incentives (including those that are created by relationships specific for communist method of production) are either always ignored or are numbered among moral ones. Distinction is often not made between incentives which are formed within the framework of distribution according to labor (they are inherent in socialism and ensure an equal measure of consumption for an equal measure of labor) and within the framework of commodity-money relationships, where the correspondence of a measure of labor and a measure of consumption is substantially modified by the supply and demand correlation.

Insufficiently substantiated are the assumptions that curtailment of address planning, growth of independence of economic units as commodity producers (that is progress of their isolation) and a shift to the so-called "indirect" methods of regulation will give rise to progress of democratism in management. To say nothing of the fact that any democracy in commodity economy is proportionate to the volume of financial and commodity resources of commodity producers in the presence of a truly dictatorial situation of the market, even such a democracy is hardly realizable at the contemporary stage of socialization of production. Since a shift to a purely commodity mechanism in the formation of proportions and exchange of activity is objectively impossible in socialist economy, and this is acknowledged virtually by all, a problem arises: how democratic are the management methods, which contain indirect (that is the so-called "economic") regulation<sup>4</sup>, will they lead to the revival of same difficulties and problems, particularly elements of bureaucratism, in a new form?

If the possibility of social differences arising in the position of collectives is taken into account here (and they concern not only income, but also conditions of personality development: labor, rest and consumption), which are caused not so much by the difference of their labor conditions as by the possibility of individual producers regulating the market and deriving high profit by using social tools of labor for local (in the final analysis personal) goals as well as the extralegal redistribution accompanying this (bribes, thefts, damage of material means and so forth); the appearance of commercial secrets (otherwise market redistribution of income is impossible); and restricting the principles of collectivism to relationships within individual groups, and as a consequence undermining them in relations between collectives, then all of this taken together contradicts to a certain extent the thesis on strengthening democratism and on existence of an association of all the people, which is a single organizer of the economy and a producer on the national economic scale. Therefore, the economic isolation of enterprises, which leads to the growth of independent management of individual units can only restrain strengthening the socialist democracy OF ALL THE PEOPLE and participation of workers in managing ALL social production.

Bureaucratization of management can also increase at the level of a primary production unit. The activity of an enterprise over and above a stable long-

term plan requires constant adoption of management decisions of an ad hoc nature and effective reaction to constantly changing market conditions. This necessity arises, even if at a lesser degree, when indirect systematic regulation of individual economic spheres is introduced in the economy on the part of states. In any case it is, first of all, the administration which will be the subject of such management. Accordingly, the possibility of bureaucratic methods of supervision being manifested can intensify (here the subjective factor and the level of maturity of every manager and his awareness of collectivism have an effect). And even if it cannot but be taken into account that any economic action needs to be administratively-legally secured, it should be stressed that fundamentally another aspect of the problem is important for socialism--the participation by members of a labor collective in production management affairs. In this connection it is doubtful that an increase can be expected in participation of workers in the affairs of an enterprise only through formation of direct dependence between the size of their income and the financial results of a production unit's management.

Development of indirect methods of management and a commodity-money form of economic relations does not lead to strengthening of democratism and equality in the relations of producers and consumers. As noted above, the limits of this equality are already set not only by commodity and money resources of contractors, but also by their ability to render regulating influence on production and exchange and to change supply and demand locally. The latter depends, first of all, on the level of concentration and specialization of production, which is a result of its socialization, leading, as noted by V. I. Lenin, to UNDERMINING of commodity production.

The aforementioned problems of using indirect management methods permit a conclusion: the subject of contemporary discussions is not so much the methods of management and the principles of building an economic mechanism as the deep-seated fundamentals of socialist society, its economic relations and the direction of their development under conditions of real socialism. The strengthening of economic isolation of producers and the predominance in the economy of indirect methods of regulation would noticeably affect the entire system of socialist production relations by giving rise to substantial limitations in the utilization of the law of conforming to plan, the basic economic law, the law on distribution according to labor and other.

All of these comments, however, do not remove the need for analyzing the possibilities of planned economy in solving those important economic problems which are posed before us by life and which could hardly be removed by methods of commodity economy, supplemented by an "economic" (indirect) centralism.

Let us note right away that the basic direction in the development of planned economy is by no means planning from a unified center of tens of millions of products of labor. The insincerity of such reasoning is obvious. These rhetorical "exercises" only expose the practical insolvency of these kind of critics of centralized planning. No one who clearly imagines the economic relations of such an enormous country as ours can raise such a question seriously. Therefore, there is no subject for discussion here. The solution of the problem is ensured by a unified planning system, which has a complex,



multilevel structure that embraces all links of the national economy. To analyze and improve its activity on the basis of strengthening the democratism of planned management is considerably more difficult than to count on the automatism of indirect regulators and the "democratism" of commodity economy, but the movement precisely in the first direction is today necessary as never before.

The given path for improving planned economy intends as the first step the growth in the role of an adjusted system of nationwide stock-taking and control over all elements of reproduction: production, distribution, exchange and consumption (correspondence of the measure of labor and consumption). It is not being reduced to a narrow departmental control and inspections and collection of reports that are prepared by those who are being controlled, but is being implemented as stock-taking of all possible resources and ways of developing social production by persons who are economically interested in the "most strict and general," as stated by V. I. Lenin, stock-taking and control. The possible way of their realization is by strengthening the control of collectives of consumers over producers and combined activity of labor collectives of associated enterprises in discovering unused resources, their conservation and particularly raising the quality of use values, which would satisfy the requirements of society members more fully. On this basis it is possible to strengthen not only substantiation, but balance of specific plans as well. Closely connected with the development of nationwide stock-taking of requirements and resources and control over production and management organs is the most important direction in improving planned economy--EXPANDING WORKERS PARTICIPATION IN MANAGEMENT AT ALL LEVELS RIGHT UP TO THE NATIONAL ECONOMIC and transforming all members of society as a whole and each individually into a true master of social production.<sup>5</sup> Strengthening PLANNED INDEPENDENCE OF LABOR COLLECTIVES, which unlike isolation of commodity producers is being built not according to the principle of independence from the national economic plan, but PLANNED INITIATIVE, is an essential direction in the development of planned economy on one's own base. Its development can be realized, in particular, by strengthening counter planning, which in some places is suffering from formalism, and stimulation for discovering specific production reserves during the preplanning stage. Let us emphasize: it is not simply a question of a collective assuming additional plan commitments "for production volume" (for example, for increasing production volume by 1 percent compared to plan), but of encouraging specific members of a labor collective who have determined concrete (technological, organizational, social) means for solving major production problems, the implementation of which gives a substantial increase in quality, labor productivity and so forth.

Interest in a stepped up plan can be achieved not so much by stimulating (paying bonuses) an administration for every additional percent of planned commitment as on the basis of paying bonuses to specific members of a labor collective for specific proposals, which are developed during the preplanning stage and have a substantial effect on production. A positive role in the matter of developing independence of labor collectives has been played by an experience approved in the GDR of public defense of draft plans with participation not only of workers of higher level of authority, but also of representatives of associated enterprises (consumers and suppliers) as well as of enterprises of the same type.

It is like this that ways are outlined for solving the fundamental problem of planned economy--improving forms of organization of the SUBJECT OF PLANNING.<sup>6</sup> This also ensures a sound determination of OBJECTS OF PLANNING. In responding in a most general form to the question as to WHAT must be planned in planned economy, let us stress right away that here, as noted earlier, there is no need to plan "all and everything" from the Center, and no one is striving toward this. Every economist is familiar with the hierarchical system of management (indeed it is customary to say nothing about its existence when mention is made that everything cannot be planned from the Center). The Gosplan draws up a plan which determines the output of production of national economic significance. Production, whose basic consumer is contained within a certain complex, is planned by an organ which supervises its activity, and so forth down to every worker. The object of planning are only "entries" and "exits" (deliveries of specific kinds of finished products and means of production to a planned consumer with consideration of quality parameters) of certain production links (from intersectorial national economic complexes to a brigade), which are allocated based on the structure of social division of labor and not departmental affiliation. In this case only MASS PURPOSE PRODUCTION is subject to address planning (under conditions of direct stable technological relations of associated enterprises it is sufficient to plan only the final product of cooperation).

Such, let us say, "breaking up into smaller units," or more accurately developing a system of production and consumption plans from the top downward, of course, gives rise to certain contradictions and is capable of causing a lack of balance in individual planned positions with regard to a production list worked out in detail. The possibility of avoiding them on a planned basis is ensured by direct agreements between economic units. In this case not petty regulation of an agreement's parameters is planned, but determination of an agreement's contractors and, of course, the product of their cooperation. All of these measures make it possible to substantially reduce the volume of a planned products mix and limit it at every level of management of several thousands of positions when the entire management system as a whole (from the Gosplan to a brigade) ensures the system of address tasks (in a plan or an agreement) in all basic kinds of production.

Under these conditions the quality and time factor is put to the forefront--that is the problem of TIMELINESS AND EFFECTIVENESS OF PLANNING and stock-taking of urgent requirements of production and material and technical supply. But in this case it is necessary to take into consideration the fact that it is doubtful that the entire system of national economic production and supply plans can be developed on time and with consideration of urgent requirements, if it will duplicate the tasks of the past every time without taking into account the technical progress and its planning as a moving force of production, whose problems were discussed at the conference in the CPSU Central Committee on questions of accelerating scientific and technical progress in June 1985.

In the meantime on the basis of solving the tasks set by the April (1985) plenum of the CPSU Central Committee with regard to improving the organizational structure of management, getting rid of petty administrative guardianship (an abundance of not always sufficiently sound methods, planning of intraproduction turnover and so forth) and under the condition of shifting to a five-year plan



and long-term agreements as a basic form of a plan, concentration of normative calculations within the framework of some major scientific research subdivisions,<sup>7</sup> rejecting routine regulation over and above and in spite of a plan and organizing and keeping production capacities in reserve as proposed by science and practice long ago during unification in the network of existing computer--under these and aforementioned conditions (nationwide stock-taking and control, local plan initiative and so forth) the problem of promptly drawing up a plan and balancing it is entirely solvable.

Thus, an analysis of the ways for improving objects of planning and forms of organizing the subject of centralized supervision of economy in planned economy --a nationwide association of workers, united for combined activity with regard to organizing production--makes it possible to formulate a fundamentally important thesis: direct methods of address planning and management and centralism in planned economy are occurrences of specifically socialist production relations, public ownership of means of production and an effective means of supervision of economy for solving tasks with regard to all-round development of personality of every society member, which, however, is realized only under the condition of effective and constant initiative from below and mass stock-taking, control and other forms of workers' participation in management at all levels. Address centralized planning cannot function successfully under conditions of substantial influence on the economy of departmentalism, localistic tendencies and manifestations of bureaucratism. However, the existence of such phenomena cannot serve as an argument against its development. The way for overcoming the aforementioned shortcomings is not by curtailing centralized supervision, but by developing its democratic character. The latter assumes not a shift to indirect methods of regulating the economy, which relies on the growth of isolation of producers, but a democratic nature of decisions adopted in a centralized manner and their fulfillment with initiative on the basis of collectivism and general participation of workers in managing the national economy at all levels up to the national economic one with unconditional development of labor and social activity of workers collectives and their planning initiative.

Development of centralism within the limits determined by the existence of a nationwide association,<sup>8</sup> which comes forward as a unified organizer and producer, does not automatically solve all problems and difficulties of socialist planned economy. But it makes it possible to ensure a reliable stock-taking of social requirements and resources, bring balanced and stepped up plan tasks to direct producers and ensure the interest of the latter in fulfilling a plan. This interest is engendered, first of all, from their position in society as actual co-masters and co-organizers of social production, the linking of the subject of adopting decisions and the subject of their fulfillment and is supplemented with stimulation on the basis of distribution according to labor and encouragement for adopting stepped up specific planned commitments and their fulfillment. Effective utilization in socialist planned economy of commodity-money relationships is also possible on this and only this basis alone.

The distinctive feature of socialism's contemporary stage of development consists in the fact that internal reserves of socialist planned economy are

still not being fully used and there are great opportunities here for accelerating the country's economic development on the basis of all possible utilization of such fundamental principles and advantages of socialism as the planned nature of our economy, the priority of social goals of economic development and the possibility of its deliberate optimization for the realization of deep qualitative changes in production in the interests of society.

#### FOOTNOTES

1. Along with centralism, as such, planned economy includes as its immanent features the independence of labor collectives (which is necessary inherent in an economic unit of planned economy regardless of existence of commodity-money relationships) and practical general participation of workers in management at all levels (from an enterprise to the national economy as a whole).
2. KOMMUNIST, 1985, No 5, p 39.
3. Under conditions of preserving commodity-money relationships, satisfying effective demand is one of the possible forms for solving tasks which are dictated by the basic law of socialism. But this form, first of all, is not the only one (there are forms such as development of man in labor, social creativity, public consumption funds and other) and, in the second place, shades the specific content for socialism (and not for commodity economy)--the principle "From each according to ability, to each according to labor."
4. Tax, credit-financial and similar regulation--typical methods of state volitional influence on economy, they are in a strict sense among administrative methods which are implemented by the state as a particular political organ. These functions also bear a character of an economic process, since the state implements such regulation not as a political organ, but as an owner of considerable financial, export and other resources, which make it possible to exert a determining influence on financing, extending of credit and other processes.
5. Significant in this respect is the statement by A. G. Solipatrov, a fitter of highest qualification: "It is not enough to say: 'You are a master.' A master is one who is being considered, who participates in management of work. Not only in performing some work with his own hands, but also in considering it carefully and preparing for it, in a word, namely in managing it. There where this exists, there is a feeling of being a master." (A. Levikov. "Kaluzhskiy variant" [Kaluga Version], Moscow, Politizdat, 1982, p 144).
6. Improvement of stock-taking and control in the production sphere (in which V. I. Lenin saw elements of the essence of socialism) as the simplest form of general participation in management of the national economy, development of counter planning and concerned discussion of stepped up plan and preplanning

drafts in labor collectives, including in low-level ones--all of these occurrences create conditions for uniting workers in a nationwide association, which comes forward, in the opinion of classics of Marxism-Leninism, not only as a total worker but as a unified organizer of production as well.

7. See PLANOVOYE KHOZYAYSTVO, 1985, No 1, pp 61-63.
8. To the extent that limits of centralism in planned economy are determined not only by the Center's relationship to economic units, but also by interaction with the entire system of organs of workers participation in management (beginning with labor collectives).

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## INVESTMENT, PRICES, BUDGET AND FINANCE

### ECONOMIST ANALYZES NATIONAL INCOME STRUCTURE

Moscow PLANOVoye KHOZYAYSTVO in Russian No 10, Oct 85 pp 69-78

[Article by A. Koryagin, doctor of economic science and professor: "The Relationship Between the Cost and Natural Material Structure of National Income"]

[Text] The net product of society, its national income, occupies the central place among socialism's economic categories.

A great deal depends in the progressive economic movement on how its growth rates and cost and natural and material structures are formed, what relationship exists between these structures, and how they satisfy the changing requirements of society.

As was pointed out during the April 1985 CPSU Central Committee Plenum, the distinctive features of the present stage of economic organizational development are displayed in the need that has matured to achieve a new qualitative condition of society. The party links this direction in economic progress primarily with the scientific and technical up-dating of production, with the shift of the economy to the rails of intensive growth and with the achievement of the highest world level of social labor productivity.

Both domestic and foreign circumstances require every kind of acceleration in scientific and technical progress, the total economic development of the country and -- not in the least -- the insuring of high dynamics in national income. This assumes the improvement of structural and investment policy and the search for resources which are required to accelerate economic growth and whose optimum and mobile use permits urgent social tasks to be more fully solved and the living standard of the people to be continuously raised.

The experience of recent years has shown that with an evolutionary development of scientific and technical progress alone, the improvement of existing technologies and the partial modernization of machinery and equipment cannot provide for a substantial growth in labor productivity and national income, and their rates of growth are held in check (Table 1).

Table 1. (in %)

	1970	1975	1980	1984	1980 to 1975	1984 to 1980
USSR national income (Produced).....	100	132	163	188	124	115.5
Productivity of social labor.....	100	125	147	166	117	113.2

One cannot admit that the situation, which has taken shape, is favorable for solving production and social tasks. M. S. Gorbachev pointed out in a speech during a meeting of the Leningrad party organization aktiv that the rates of growth for national income have been approximately three percent a year during recent years. This rate of economic movement does not permit the program for raising the people's material well-being to be implemented in the necessary scales.

The task of fundamental and revolutionary changes for the better and of a shift to fundamentally new machines, equipment and technological systems stands upright. It is on such a base that it is possible to achieve a repeated increase in labor productivity in the decisive sectors of the economy, a noticeable acceleration in the rates of economic growth, and the bringing of the structure and dynamics of national income into closer compliance with the growing and changing needs of society.

During the stage of the new society's mature condition, the concept of accelerating the country's social and economic development is directly defined by the action of the main economic law of socialism. This requires a more precise definition of its content. It is generally recognized that the goal of socialist production is incorrectly restricted only to increasing its material elements and increasing the people's prosperity without considering the development of the individual himself and his creative capabilities. Also, it is impossible to treat the method for achieving the goal narrowly, only from the material side or only from a position of developing collectivist relationships in the new society.

During the current stage of development of political and economic thought, it is necessary to overcome a certain one-sidedness in the interpretation of socialism's basic economic law. The character of the goal of socialist production is reflected correctly in most economic research in compliance with the Leninist thought concerning the need to insure the prosperity and all-round development of the individual in the new society. Concerning the achievement of this goal, it is possible by increasing the public property which is developed based on the highest technology and through the constant improvement of collectivist relationships. Such a definition expands the limits of political and economic analysis, introduces into it research on the



economic foundation of socialism -- public ownership of the means of production, and emphasizes that this basis can be multiplied to the greatest degree only when the achievements of science and technology are used in every way possible. In its turn, this can be effective when there exists the all-round development of relations of collectivism, cooperation and mutual help free of the exploitation of people.

At the same time, the fuller carrying out of the goals of socialist production is based on accelerating economic growth, continuously increasing the total public product and national income, and changing their structure in a timely and flexible manner in compliance with the growing and qualitatively changing requirements of society and its members. In doing this, the problem of forming the natural and material and cost structures of national income seems to be a complicated and extremely contradictory one. The changes within them and the relationships between them are today connected with the beginning significant forward movement along strategically important avenues, with the structural reorganization of production and with the shift to primarily intensive forms of economic growth.

On the one hand, we are talking about the structural reorganization of the production of the means of production (Subdivision 1) and about a significant increase in the percentage of machine building and the other branches, which determine scientific and technical progress in the national economy, in it. It is planned to increase the rates of growth within machine building during the 12th Five-Year Plan by 1.5-2-fold. On the other hand, it is necessary to bring the production of consumer items (Subdivision 2) into greater compliance with the needs of society and with the fulfillment of social programs. The sum total of produced consumer items has been called upon to improve the population's food supply and satisfy more fully the needs of the workers for various goods and services, the construction of housing, the improvement of health care, and the development of education, science and culture.

Accelerating the rates of development of machine building will naturally increase its share both in the total social product and in national income and its cost and physical sizes. Along with this, the share of this branch (especially machine-tool building, the production of computers, instrument making, electrical engineering, and electronics) will increase in the accumulation resources. The other progressive branches of Subdivision 1 public production will have an effect on the structure of national income in this direction.

Scientific achievements, which permit the application of new technologies and the up-dating of the production apparatus of the entire national economy, are being implemented first in machinery and equipment. In this regard, new items are appearing in the formation of the natural and material structure of national income: The production of individual machine tools and other types of machinery and equipment will be replaced by the manufacturing of production complexes which insure a repeated increase in labor productivity. This means that the consumer qualities of the existing part of the national economy will be considerably improved. Production complexes are intended both for the

erection of new production installations and for the replacement of existing machinery and equipment, the reconstruction of enterprises and the up-dating of their production fixed capital.

Changes in the structure of the national economy under the conditions, which have taken shape, depend to a great deal on the quality and variety of materials. As experience in ferrous metallurgy testifies, a further quantitative increase in the production of metal does not solve the problem of developing the branch. For example, no one in the world produces more steel than the USSR, but we are still short of it. This is connected mainly with the quality of the metal: It does not always satisfy modern requirements -- it is the same with the range of products of the metal and the technology for using it. A qualitative improvement in the production of metal and other products of labor is a necessary condition for substantially curtailing expenditures of material per unit of national income. This will permit its content to be enriched with new use values.

The natural and material and cost structures of national income are a unity of contradictions and express different aspects of socialist production relationships. The use qualities of the products of labor have primary significance in this unity. The cost value of national income and labor expenditures are only fully recognized by society and its members when the quality and variety of items satisfy their requirements.

Under modern conditions, the interconnection of the dynamics of national income with savings in expenditures of both material and human labor is being displayed more and more noticeably. Special attention is being paid in party documents and decisions to savings in the material resources which we still expend more on per unit of national income than is done in a number of other countries.

The USSR has enormous natural resources at its disposal. Their extraction, however, is not becoming cheaper and -- in a number of cases -- it is growing more expensive in connection with the movement of the extraction industry to the country's north and east. During the past 10 years, expenditures per one ton of increase in the extraction of oil have increased more than 1.7-fold. That is why the urgency of the problem of the economic use of resources and the introduction of energy-saving and resource-saving equipment has intensified. In our opinion, savings in material resources will not directly increase society's net product in a political and economic regard; at the same time, the public wealth is maintained and multiplied.

Savings in materialized labor means that manpower will have an opportunity to create a greater amount of use values from this amount of resources. In this regard, public work does not save in itself -- it is human labor: The savings from material labor is the result of the fruitfulness of human labor. It permits society to switch the appropriate labor resources from the extraction of fuel, raw material and materials to the production of prepared items and use values. In this case, both the physical and the cost values of

national income are increased. However, the savings in material resources directly emerge only as a very important factor in increasing the physical amount of public wealth.

From a natural material aspect, national income and its structure are constantly changing and improving. This permits a dual task to be solved more completely: To accelerate the introduction of the accomplishments of scientific and technical progress, increase the output of the latest generation equipment, automate production processes and expand the assortment and to increase the quality of the goods and services being offered to the population. Party documents point out that everything is not being done in this respect in accordance with the changing conditions. The task of increasing the quality of produced items is especially urgent. This pertains both to subdivision 1 and 2 public production. The struggle for quality, however, has still not received the necessary development in enterprises. This hinders scientific and technical progress and restrains economic growth rates.

One of the objective conditions for solving the mentioned problem is an improvement in the system for monitoring the quality of produced items. Evidently, it does not fully satisfy modern requirements for the progressive development of production and the rapidly changing requirements of the population: Demand has clearly shifted in the direction of items of high quality and their varied assortment.

Under present conditions, the bodies for monitoring product quality have been called upon to subordinate collective and personal interests more fully to the national interest. These bodies should be interested not so much in the quantitative work indicators of the labor collectives as in the correct evaluation of the quality of the produced items. In our opinion, the need has matured to remove the bodies for monitoring quality from departmental subordination. In a number of cases, a duplication of plant control by a non-department body and directly by the customer is required.

As the standard of living of urban and rural workers has increased during recent years, the structure for producing consumer items has been improved and the variety of items has expanded. There are, however, also negative items in consumption. For example, the production, sales and consumption volumes of alcoholic beverages have not decreased.

In connection with this, extremely complicated social aspects in the economic movement have appeared in the natural and material and cost structures of national income.

The party is taking steps to limit substantially and to exclude in the future the consumption of alcohol from society's life, with all its innumerable social calamities. The curtailment of this type of production will evoke definite structural changes in the total social product and national income.

Part of the population's income, which goes into the state budget and which is used for production and nonproduction needs, is realized in the price for wine

and vodka products. Curtailing the production of alcoholic beverages, of course, will decrease the mentioned revenue in the state budget. At the same time, the population's income will "be forced to look for" new uses. Additional income will be formed in family budgets, and the state will seemingly "lose" part of its budget revenues.

A socialist society is capable of resolving this contradiction. This problem, however, cannot be solved automatically. Purposeful planned actions by society are needed. To a certain degree, the released incomes of the workers will be expended to acquire the normal range of goods whose output volume must be increased. When doing this, special attention must be paid to increasing the production and sale of goods and services that enjoy increased demand among the population -- the so-called "scarce items."

All of this will improve the situation in families and increase the living standards of the workers. The overcoming of drunkenness will strengthen labor discipline and serve to markedly increase labor productivity and national income and to increase savings and consumption resources.

Thus, contradictory elements, which are overcome during the process of widening the scales of socialist reproduction, optimizing its proportions and introducing a product list in accordance with rapidly changing demands and during the process of insuring high growth rates in labor productivity and solving social tasks in the interests of urban and rural workers, are inherent in the formation of the national income's natural and material structure.

The process of forming the cost structure of national income, which occurs under the influence of the natural and material structure that has taken shape, is no less contradictory.

In its cost expression, national income emerges as an integral part of the cost of the total volume of material goods produced during a year -- the total social product.

Statistics provide somewhat contradictory information on the percentage of national income in the total social product. When calculating the dynamics of these two values in comparable prices, a picture of their close growth rates is drawn. Thus, the gross social product was 192 percent in 1984 when compared with 1970, and national income -- 188 percent. Approximately, the same gap (4%) existed between them in 1975 and 1980.

It is evident that even in comparable prices, which cannot catch structural elements with sufficient accuracy, the overall volume of expenditures of embodied labor is growing somewhat rapider than national income and expenditures of human labor. If one takes the value of gross output and national income in current prices, the structural characteristic becomes considerably clearer: The percentage of national income in the gross public product was 45 percent in 1970, 42.1 percent in 1975, 42.8 percent in 1980, and 42.4 percent in 1983. With some fluctuations, the decrease in the share of national income is observed completely definitively. At the same time, the physical amount of national income has grown considerably as was already pointed out.



The acceleration of scientific and technical progress and the strict regime of savings in material and labor resources are raising a number of questions of a structural nature, including: How the acceleration of scientific and technical progress affects the relationship of material and human labor and the reimbursement fund and national income and how the decrease in material-intensive items affects this relationship?

Concerning the acceleration of scientific and technical progress, it is undoubtedly accompanied by savings both in materialized and in human labor. The whole question, however, lies in which process will proceed more rapidly. Sometimes the inclination is displayed to overestimate the capabilities of the progressive dynamics of savings in past work. Then, a conclusion is drawn about the fundamental change in the relationship of the growth rates for subdivision 1 and 2 products in favor of the latter. However, this thesis is not corroborated by any convincing arguments. Its essence consists of the fact that past work does not save by itself. This process is directly and decisively determined by savings in human labor on the production of a unit of use value, i.e., by raising labor productivity.

Numerous examples of incorporating the latest equipment and technologies testify to the sharp decrease in expenditures of human labor on the production of a unit of use value and to the substantial change in the structure of production expenditures. In any case, the percentages of material expenditures and the payments for labor in product costs change places and the share of materialized labor grows noticeably. This means that scientific and technical progress does not overthrow the operation of the law of outstripping growth for the production of the means of production in favor of subdivision 2, but stimulates the outstripping growth of subdivision 1, especially those branches that determine scientific and technical progress throughout the entire national economy.

However, if this is so, another question arises: Does scientific and technical progress cause an increase in the material-intensiveness of the reproduction process? In our opinion, a displacement of concepts is being made in the discussions on this subject. Material-intensiveness pertains to individual use values. The introduction of the accomplishments of science and technology and the improvement of production technologies are, of course, aimed at the output of items or the production of energy with possibly fewer expenditures of material resources. The whole matter here, however, is how expenditures of human labor, the essence of increasing whose productivity consists of the capability to process a growing mass of material resources into prepared items within a unit of time, conduct themselves.

The percentage of material expenditures is objectively increasing both in unit use value and in total public product. At the same time, however, absolute expenditures of material resources per unit item are decreasing or should decrease. It is necessary to evaluate in this way the significance of material-intensiveness which can be decreased with the simultaneous increase of the percentage of past labor in the total social product.

The problem has become noticeably more complicated at the present time. Objective conditions are placing limits on increasing the extraction of natural mineral materials. This means that increasing labor productivity has been called upon to save material resources as much as possible and to create a larger amount of use values of higher quality from their smaller volume. This contradictory problem is being solved as a result of the progress in science and technology which is permitting a more thorough and complex processing of primary materials to be carried out, their durability and other characteristics to be increased and the volume of produced use values to be increased by this.

The conformity of law of the increase in the percentage of materialized labor in the public product is not losing its force but is acquiring a different qualitative definition. Along with this, the physical amount of national income in the socialist society is continuously growing and becoming enriched in accordance with the growing and qualitatively changing needs of society and its members.

The problem of the formation of the cost structure of national income itself is no less complicated and contradictory. During the process of its production and realization, it primarily emerges as a necessary and surplus product in a socialist society. National income should pertain totally to a necessary product. K. Marx wrote in this respect: "The elimination of the capitalist form of production will permit the working day to be limited to necessary work. However, necessary work should expand its limits with everything else being equal because, on the one hand, the workers' living conditions should be enriched and his living requirements should grow and, on the other hand, because it is necessary to add part of today's surplus labor -- that is, that labor which is required for the formation of public fund reserves and public savings funds -- to necessary labor."\* In this case, K. Marx regards the social and economic essence of human labor in so far as the entire result of the workers' activity in material production belongs to society and is used for their interests without exception. There is, however, another side to the matter. During public production, the product of human labor is objectively intended for fulfilling certain functions: On the one hand, it emerges as the living fund of material production workers and as a resource for the reproduction of their manpower and the insuring of their all-round development; on the other hand, a portion of the product of human labor should always be used to expand public production, develop it based on the highest technology, solve social tasks, and insure the management and strengthening of the country's defense. From this comes the division of the net product into necessary and surplus ones which emerge during the stage of distribution and use as national income in different forms.

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\* K. Marx and F. Engels, "Sochineniya" [Works], Vol 23, p 539.

The amounts of necessary and surplus product grow during public reproduction. Existing statistical publications permit one to judge about these quantities within the framework of current prices and that is why their dynamics are expressed only approximately. Concerning their correlation, it is caught more definitively since the base of current prices exactly permits the structural elements to be better set off.

What is the objective trend in the formation of the correlation between the surplus and necessary product in a socialist society? It would be possible to discuss it because the process of the maximum increase in the necessary product for the sake of material production workers and the increase of their well-being is natural in the new society. In this respect, the norm of surplus product ( $m:v$ ) would have a tendency to decrease. However, neither theoretical considerations nor economic movement practices support this conclusion.

The fall in the surplus product norm would mean a relative and -- in the final analysis -- an absolute decrease in the resources for expanding production and improving it technically and a contraction in society's social programs and capabilities for accumulating and increasing public wealth. A steady growth in labor productivity permits a socialist society to solve a dual task: to build up the absolute dimensions of both the necessary and surplus product during the outstripping dynamics of the latter and also to raise the living standards of the workers and increase production funds -- the basis for further progress in public production.

Statistics (with a certain imperfection in measuring cost values) confirm the theoretical conclusions about such an objective direction in economic movement. The tendency toward increasing the surplus product norm is demonstrated comparatively simply. In 1959, it was 85.5 percent in accordance with the accounting methods used by the USSR Central Statistical Administration, 90.8 percent in 1966, 98.6 percent in 1972, 97.6 percent in 1975 and 99.1 percent in 1979. The surplus product norm increased for both subdivision 1 and 2 although to a different degree: In subdivision 1 it was 62.3 percent in 1959 and 74.3 in 1979; in subdivision 2 it was 139 and 149.2 percent, respectively. The fact that the dynamics of the surplus product norm in both subdivisions differs insignificantly, deserves attention. This is mainly explained by the fact that a certain portion of the surplus product, which is created in subdivision 1, is realized in the prices of subdivision 2 products. Other factors, for example, a narrower production cost structure than for subdivision 1, also operate.

The general surplus product norm depends a great deal on the structure of public production and on the correlation of the rates of growth of its two subdivisions. With a certain conditionality, it is possible to think that based on the natural and material form, surplus products are primarily the means of production and necessary products are consumer items. Because the law of the outstripping growth of the production of the means of production operates under the conditions of scientific and technical progress, this factor strengthens the tendency to increase the surplus product norm. In our

opinion, the above-mentioned tendency will increase during the next few years in connection with the sharp growth in machine building, expanding savings resources. During periods when the growth of subdivision 1 products for subdivision 2 is accelerated, an acceleration in the growth of the production of consumer items and, consequently, of necessary products will occur.

The dynamics of necessary and surplus products affect the formation of the correlation between accumulation and consumption. At times this is presented so that national income and accumulation grow equally under the conditions of an extensive form of reproduction, and the required result can be achieved under an intensive form and with a decrease in the general and production savings norm.

During recent years, these values have taken shape in the country as follows: the general savings norm was 29.5 percent in 1970 and the production one was 20.5 percent; in 1975, they were 26.6 percent and 20.3 percent, respectively; and in 1980-- 23.9 percent and 17.8 percent, respectively. A decrease in the growth rates of public labor productivity and the growth rates of national income, however, occurred with this decrease in the production accumulation norm.

The cited facts testify that the lowering of the savings norm has its own limits which one must not disregard. Of course, a certain decrease in the norm of general and production savings is not excluded under certain conditions. However, the maintenance of a high dynamic in national income and of an increase in national consumption requires a continuous increase in the effectiveness of savings. If this does not occur, the general rate of economic growth can be lowered.

Consequently, under modern conditions the task does not consist of decreasing the savings norm while being unprepared in a material and technical respect. Economic policy has been called upon to achieve the optimum correlation between accumulation and consumption, the acceleration of scientific and technical progress in every way possible, high dynamics in the productivity of public labor, and an increase in the effectiveness of savings based on the intensification of the economy.

Branch structure occupies a considerable place in the description of the natural and material and cost aspects of national income. It shows how industry, agriculture, transport, communications, trade, procurement, logistics, and the other branches, which are connected with continuing the production process in the distribution area, are sited in material production. The natural and material and cost structures of national income are integrally interconnected in this regard and cannot be separated from each other.

Statistics provide the amount of product of the above-mentioned large branches in actually existing prices. This sets off the changes that are occurring in a structural respect. Comparable prices catch these changes significantly more poorly. However, contradictory elements are displayed even during a superficial examination of the branch structure of national income.



Table 2 (in %)

	1970	1980	1983
Total national income.....	100	100	100
including:			
Industry.....	51.2	51.5	46.3
Agriculture.....	21.8	14.9	20.1
Transport and Communications...	5.6	5.8	6.1
Construction.....	10.3	10.3	9.7
Trade, procurement, logistics, etc.....	11.1	17.5	17.8

It is necessary first of all to note the sharp increase in the share of trade, procurement and the other branches of this area. This is connected with the fact that the volume of production expenditures for labor to deliver products to the places of consumption (processing, packaging and wrapping, transportation, storage, etc.) have grown during the last decade. At the same time, a certain overexaggeration in the share of this area has had a noticeable effect: All of the expenditures for the sale of products have been included in it at a time when a significant portion of them are distribution costs and not production ones.

The share of agriculture, which had sharply decreased in 1980, rose again but did not quite reach the 1970 level. The increase in the share of agriculture reflected new elements in the pricing of its products, which had been established by the USSR Food Program. At the same time, the calculations in actually existing prices did not catch the redistribution of the surplus product in favor of the centralized fund. Statistics have recently defined more precisely the amount of national income created in agriculture, distributing it among the branches in proportion to labor payments. In doing this, the share of agriculture had already reached not 20.1 percent in 1983 but 27.5 percent. This represents the correlation of the natural and material and cost factors approximately for agricultural products in a different way. The tasks of distributing capital investments to the branches can be solved differently.

The complete coordination of the natural and material and the cost structures of national income require the coincidence of prices with costs or, in other words, the determination of prices based on objective and socially necessary expenditures of labor. However, prices, while they exist, will in some way or other deviate from costs, satisfying certain social, economic and political requirements. That is why the need arises for the broader use of balancing savings in the direct measurement of labor expenditures (within the limits of the possible) and of the calculations, which approximate prices to the socially necessary expenditures of labor, in planning practices.

These estimates permit the connection of the different aspects of the structural changes in the national income with the rates of scientific and technical progress and public labor productivity, with the increasing level of national consumption and with the ever fuller satisfaction of the rapidly changing needs of the workers to be seen more clearly.

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## INVESTMENT, PRICES, BUDGET AND FINANCE

### WORKING CAPITAL STRUCTURE, FUNCTIONS REVIEWED

#### Turnover Rate

Moscow EKONOMICHESKAYA GAZETA in Russian No 40, Oct 85 p 2

[Article: "Turnover Rate of Working Capital"]

[Text] The increase in the effectiveness of social production is largely determined by the efficient, economical use of working capital. Working capital is the resources in the reserves of raw, basic, and auxiliary materials, fuel, and articles in incomplete production, reserves of finished output in commodities, and also in the form of a definite norm of one's own monetary funds. We are dealing with the attempt to produce more output with lesser expenditures of material resources, and having economically substantiated amounts of reserves of raw and other materials at the enterprise warehouses, and optimal volumes of uncompleted production, in order to move the finished output more quickly to the consumer.

#### Necessity of Acceleration

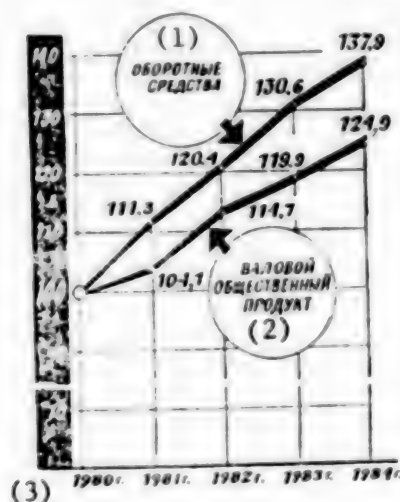
The movement of working capital through the various stages of production and circulation is guaranteed by the reproduction cycle at enterprises, current production consumption, and the functioning of the circulation sphere. And the more rapid the turnover of the material and monetary resources in the sphere of production and circulation, the smaller the amount of material and monetary means that society can channel into maintaining the production process. Consequently, the more funds that society can allocate to the expansion of production and to the goals of consumption and of improving the welfare of the workers.

The efficient use of working capital makes it possible to carry out the expanded reproduction with relatively smaller increase in the volumes of working capital. On the scale of the national economy, these are extremely considerable amounts, and the possible economy of resources is substantial. For example, in 1984 the increase in working capital in the national economy came to 32 billion rubles, or approximately 6 percent of the national income.

The economical, efficient use of working capital is an important area in the work of assuring the intensification of production.

In recent years, in the national economy, there has been an increase in working capital at rates that do not correspond to the growth of the volume of production. With an increase in the gross social product in 1981-1984 by 24.9 percent (computed in prices that were actually in effect), working capital in the national economy increased by 37.9 percent. These negative processes were given special attention at a conference of party and economic activists of Tyumen and Tomsk oblasts. It was emphasized that the taking out of funds from national-economic circulation completely "erodes" the effect to be obtained from the economizing of material resources.

Growth Rates of Working Capital and Gross Social Product  
(in prices actually in effect)



[Key]: 1 - Working capital  
2 - Gross social product  
3 - 1980, 1981, 1982, 1983, 1984

In order to accelerate the turnover rate of working capital it is necessary first of all to mobilize the organizational, economic, and social factors, to establish proper order, to increase responsibility and discipline, to improve the organization of production and labor, and to improve the economic mechanism. "The economic managers and specialists in the outlying areas," M. S. Gorbachev said, "are completely capable of resolving this problem. What are required here are no directives of any kind. The only thing that is necessary is to take a self-interested approach to the job at hand. This is a most vital question for our economic services -- Gosplan, Minfin [Ministry of Finance], Gossnab. It is necessary, in a thoroughgoing manner, to make more stringent the system of financing and providing credit for material reserves."



## Use of Working Capital

As a result of the outstripping growth of the volume of working capital in the national economy as compared with the growth of production, there has been a slowing down of the turnover rate of working capital from 145.1 days in 1980 to 160.1 days in 1984. The slowing down of the turnover rate means a reduction in the effectiveness of the working capital and their return. With the aid of one ruble of working capital, in 1984 our economy produced output valued at 2.25 rubles, whereas in 1980 it produced 2.48 rubles. The reduction in the effectiveness of the use of working capital in the individual branches of the national economy can be seen from the following data concerning the production of output per ruble of working capital (in rubles):

	1980	1984
industry	4.78	4.22
agriculture	3.62	3.28
construction	1.26	1.23
transportation and communication	4.35	4.07
trade, procurements, and other branches	0.76	0.7

The data shown in the diagram for the speed of turnover of working assets in 1975 attests to the fact that the slowing down of the turnover rate of working capital occurred at all stages of the reproduction process. Thus, there was an increase by an entire week in the average period required to keep production reserves from the moment of their acquisition until their use in production. There was an increase in the duration of the production cycle from 12 to 16 days. The process of shipping finished output began to be carried out more slowly. The period of time that the finished output was held at the warehouses increased by 3 days and reached 11 days.

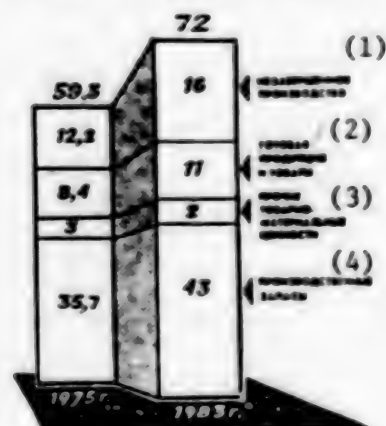
The slowing down of the turnover rate of working capital occurs primarily as a consequence of the accumulation of volumes of commodity and material assets in excess of plan, and primarily production reserves and finished output.

## Production Reserves

The share of production reserves in industry is approximately 60 percent of the total balance of commodity and material assets. The time from the moment of acquisition of production reserves to their being put into production in industry constitutes, on the average, almost 1.5 months.

The unjustified increase in production reserves leads to the excess of material resources at some enterprises, and a worsening of the shortage at others. For the efficient organization of production reserves, it is important to guarantee the shifting of the bulk of them to the warehouses of supply-and-sales organizations. This makes it possible to increase the mobility of the resources and to reduce the scarcity with regard to a number of material assets. It becomes possible to organize the guaranteed supplying of enterprises with raw and other materials and components, thus reducing the need for working capital for the national economy as a whole.

# Turnover Rate of Working Capital in Commodity and Material Assets in Industry (in days)



[Key]: 1 - uncompleted production  
 2 - finished output and commodities  
 3 - other commodity and material assets  
 4 - production reserves

An analysis of the reasons for the accumulation at enterprises of production reserves in excess of plan indicates that the increase in those reserves to a considerable degree is linked with shortcomings in material and technical supply. At many enterprises the formation of production reserves in excess of quota was caused by the incompleteness of shipments, when, because of the lack of certain components, the enterprises were unable to fulfill the plans for producing individual types of articles, while the shipments of incomplete materials and semifinished goods that have arrived at the enterprises remain at the warehouses and in production. This situation occurred in 1984, for example, at the Troitsk Diesel Plant, the Amurskiy Metallist Plant, the Lyudimovskiy Diesel-Locomotive Building Plant, Uralmash, and the Altayskiy Railroad-Car Building Plant.

However, the basic reason for the accumulation of reserves in excess of quota continues to be the nonfulfillment of the production plans on the basis of the products list, as well as the frequent changing of the planned assignments in the course of the year, when the components have already been ordered or purchased. In the acceleration of the turnover rate of working capital, the decisive role belongs to the workers at the enterprises and ministries.

The instability of the plans for the production of output on the basis of volume and the products list, and the lack of systematization with regard to material and technical supply, are leading to the occurrence of material assets that are completely unnecessary for the enterprises, and that have to be sold on the outside.

Many enterprises make fairly active use of the right to sell surplus reserves that are in excess of the plan. For example, in 1984, enterprises of Minnefteprom [Ministry of the Petroleum Industry] sold surplus reserves in excess of plan

that were valued at 17 million rubles, thus providing for a reduction in the above-plan reserves in the ministry from 77.8 to 66.6 million rubles.

Enterprises of USSR Minstroyaterialov [Ministry of the Construction Materials Industry] sold surplus reserves valued at 44 million rubles; USSR Minneftekhimprom [Ministry of the Petroleum Refining and Petrochemical Industry], 61 million rubles. Nevertheless at those ministries the above-plan reserves in 1984 were not reduced, but, rather, they even grew. The basic reason is that the enterprises have been making extremely limited use of their right to refuse shipments or to sell materials that are no longer necessary or that are surplus. This is explained by a number of circumstances.

First, by the instability of the products-list plans, as a result of which there frequently becomes a need to have one and same kinds of materials and semi-finished articles. Therefore the enterprises strive to have their own supplies of them in the event that they are needed.

Second, by shortcomings in the credit mechanism, and primarily by the possibility of receiving bank credit to pay for the reserves in excess of plan.

Third, the material incentives for improving the use of working capital are insufficiently effective. Only the bonuses paid to workers in the material and technical supply services of enterprises, and only 10-15 percent of them, depend upon the fulfillment of the assignments for the reduction of reserves.

#### Uncompleted Production and Finished Output

Uncompleted production accounts for more than 22 percent of the working capital in the commodity and material assets in industry. The slowing down of the turnover of funds in uncompleted production is caused by the lengthening of the production cycle. This is linked both with changes in the technological processes of production and with factors of an organizational nature.

In recent years, in the structure of the reserves of commodity and material assets, the share of finished output has begun growing. That share constitutes 12 percent of the working capital in the commodity and material assets in industry. Its balances, during the years 1982-1984 alone, increased by 5 billion rubles, or 37 percent, and came to 18.7 billion rubles.

The increase in the reserves of finished output could be considered to be a desirable process if it occurred with the purpose of increasing the completeness of supply, the creation of reserves of materials and components. However, the above-quota balances of finished output grow most rapidly in those branches where, in recent years, one has observed difficulties in the sale of output: in the woolen and silk industry, and in certain subbranches of machine-building.

At a number of enterprises, the reason for the formation of above-plan reserves of finished output is the lack of the proper rhythm in the producing of articles and their shipment to the customers. For that reason finished output with a total value of 659,000 rubles remained unsold as of 1 January 1985 at the Kuznetsk Machine-Building Plant (Soyuzgormash VPO [All-Union Production

Association)) and with a total value of 250,000 rubles at the Novocherkassk Plant imeni Nikolskiy.

A negative effect upon the reserves of finished output is also exerted by the shortcomings in the planning of the production indicators. Not infrequently, sales plans are still being established in smaller amounts than the plans for the production of output, and this leads to a further increase in the balances of unsold commercial output.

The accumulation of surplus, above-plan reserves leads to the regular nonfulfillment of the assignments for involvement of material resources in economic turnover. During 1981-1984, instead of the planned involvement of material resources in material turnover in the amount of 4.1 billion rubles, there was an additional withdrawal of funds from economic turnover in the amount of 6.2 billion rubles, which occurred as a consequence of the slowing down of the turnover rate of working capital.

At the same time one can also mention a number of ministries which achieved in 1984 the fulfillment of the established assignments. They include Minelektrotekhprom, Minzhivmash, Ministroydormash, Minavtoprom, and Minenergomash. But even those ministries have the necessary conditions for the further improvement of their work, inasmuch as not all the enterprises fulfilled those assignments.

#### Acceleration Reserves

The implementation of the party's course that is aimed at the acceleration of the socioeconomic development of our country requires the questions of the turnover rate of working capital to be carefully worked out in the national-economic plans, and to be constantly monitored by USSR Gosplan, USSR Minfin, and the statistical agencies.

The practice of management indicates that opportunities for the acceleration of the turnover rate of working capital exist at all stages of the reproduction process. We have in mind primarily the guaranteeing by the ministries and departments of the stability of the planning assignments, which will make it possible for the enterprises to get rid of the shameful practice of creating surplus reserves of material assets. USSR Gosplan must say the deciding word in questions that pertain to the simplification of the procedure by which the enterprises sell the material resources that are not needed by them. It is necessary to develop more actively the guaranteed comprehensive supplying of the enterprises.

USSR Minfin and USSR Gosbank must take serious steps to improve the planning of the financial sources of working capital, must intensify the cost-accountability effect of the payment for assets and the interest for credit being offered for the acquisition of material assets. It is necessary to achieve a considerable intensification of the monitoring over the expenditure of material resources and their more complete involvement in economic turnover.

Nevertheless, the bulk of the work of straightening out the situation with regard to the use of working capital must be carried out at the enterprises. First of



all, it is necessary to establish smoothly operating monitoring everywhere over the state of the reserves of material assets, to carry out a stocktaking of them, and to determine the possibilities of using them.

The state of the production reserves and the uncompleted production must be taken into consideration when evaluating the work results of the subdivisions at the enterprises and when determining the material incentives to be paid to the workers.

The use of all the available reserves for accelerating the turnover rate of working capital will make it possible to build up the volumes of production of output without any excess additional involvement of resources, and to achieve the economically substantiated correlation in the dynamics of those indicators. Under the conditions of the intensification, the task lies specifically in guaranteeing the increase of production at outstripping rates as compared with the increase in working capital.

#### Production Reserves

Moscow FINANSY SSSR in Russian No 9, Sep 85 pp 16-19

[Article by M. V. Yarmolovich, candidate of economic sciences: "Structure of Working Capital and the Formation of Production Reserves"]

[Text] A very important condition for the successful carrying out of the tasks of our country's economic and social development is the guaranteeing of the proper coordination in the development of the branches of the national economy. The disproportions that arise cause a large amount of harm to the national economy. The overcoming of a shortage of a particular type of resource requires the improvement of the system of administering the material funds. One cannot reconcile oneself to the fact that many enterprises hold onto above-quota equipment and raw and other materials, especially metal, at a time when other enterprises have a shortage of them. The administration of material resources requires the availability of a definite quantity of production reserves, which would make it possible to shift the resources around, directing them to those places where a shortage has temporarily occurred.

In the 10th Five-Year Plan the rates of increase of production reserves in the working capital for all branches of the national economy exceeded by a factor of 1.6 the rates for increase of the gross social product. In industry, the outstripping was even greater. However, the outstripping growth of production reserves does not always lead to the overcoming of the shortage of individual types of material resources. That growth can mean an accumulation at the enterprises or organizations of surplus materials and articles, and the increase in the above-quota reserves of commodity and material assets. That, in our opinion, is what resulted from the outstripping growth of the production reserves in the 10th Five-Year Plan, although in the structure of working capital that growth did not find any reflection. In order to overcome the shortage of material-technical support what is necessary first of all is not a quantitative increase of the production reserves, but qualitative changes in the structure of their formation, which lead to the redistribution of the resources among the funds in the circulation sphere.

An important factor is the circumstance in which, in social production, there are created reserves of output which is to undergo further use or processing. These can be warehouses at the producer enterprises or consumer enterprises with one and the same size of the warehouse reserve of materials and various articles that the national economy has at its disposal. Although in both instances they constitute a reserve of material means, the functional significance of each is different. The difference finds reflection in the structure of working capital -- the proportions between the working funds and the circulation funds change.

A typical peculiarity of the structure of the funds which are in the turnover of industrial enterprises is the fact that the share of the working funds is approximately 70 percent, and the share of the circulation funds is 30 percent of the total amount in the volume of the enterprises' funds (see table). However, this structure of working capital does not correspond to the natural laws underlying the circulation of production assets. If one proceeds from the natural laws underlying that circulation (in the event of simple reproduction), then the initial phase of the current turnover (when abstracting from the fixed assets) of all enterprises --  $M - C$  ( $P_g$ ), or money - commodity (producer goods) -- cannot include more material resources than its final stage  $C^1 - M^1$  (commodity - money). The production cycle ends with the withdrawal of the same amount of material resources in the form of finished output with which, approximately, it begins.

In the event of expanded reproduction, the production reserves increase, but they are created by the output being produced by related production entities. Therefore in the working funds of some enterprises there is an accumulation of output which subsequently changes over to the working funds of the enterprises that are expanding production. Consequently, in this instance also the stages of circulation of production funds  $M - C$  and  $C^1 - M^1$  prove to be equalized with respect to the material resources of current turnover.

Directly in the production sphere one sees the circulation of the constant volume of resources (when they are evenly consumed) from the initial to the final stage of the production cycle. At all stages there occurs the consumption of resources, the conversion of them into uncompleted production, and, at the same time, the changeover from one stage of readiness to another. This process is modeled by the diagram in which the last column designates the finished output, and all the preceding columns designate the changeover volume of uncompleted production. Its value ( $H$ ) is expressed by the following dependence:

$$H = \frac{T(T - 1)}{2K}, \quad (1)$$

where  $T$  is finished output; and  $K = 1.5$ , the coefficient of unevenness of the production cycle and the buildup of uncompleted production.

By knowing the carryover balances of uncompleted production, one can, by means of iterative computations, determine the volume of finished output, the withdrawal of which completes the production cycle, and thus one can recreate the integrated cycle of production in the entire branch or number of branches, in which the individual parameters in the processes being modeled and the indicators that express them are averaged.

[Table]

Structure of the Working Capital of Industrial Enterprises in the USSR National Economy and an Alternative Version of That Structure

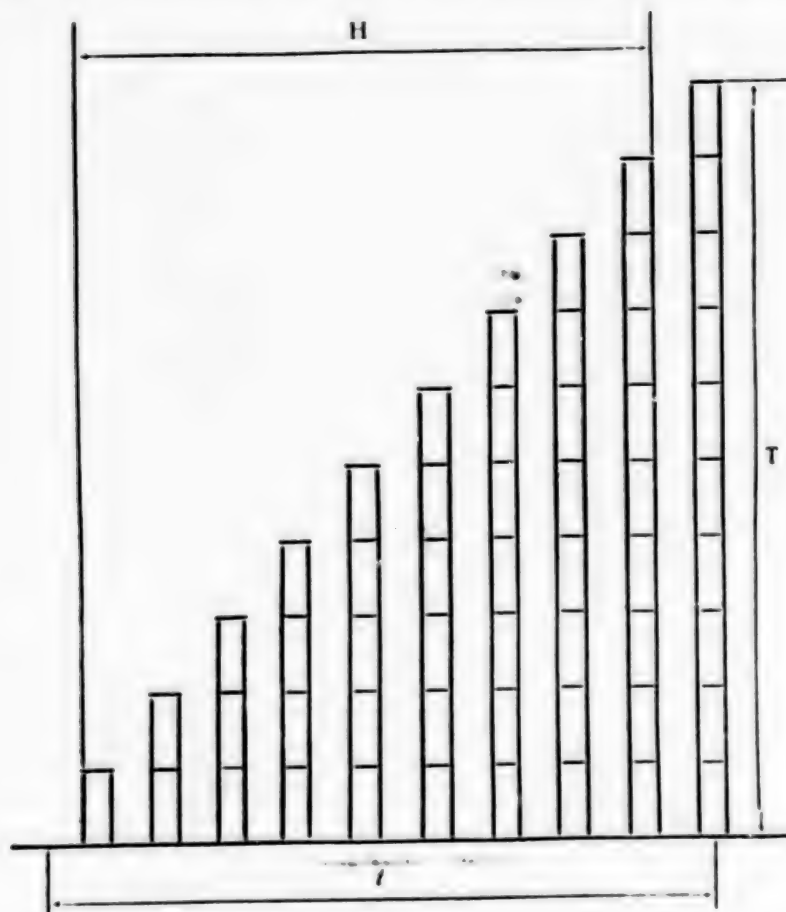
	(1) 1970	(2) 1980	(3) 1985 (прогноз)	(4) Предлагаемая структура оборотных средств
(5) Всего	100	100	100	100
(6) В том числе:				
(7) <b>Оборотные фонды</b>	69,1	69,9	70,1	43,8
(8) Производственные запасы (сырье, материалы, полуфабрикаты, тара, инструмент)	48,1	48,1	48,0	11,6
(9) Незавершенное производство	16,9	18,1	18,4	26,7
(10) Расходы будущих периодов	3,6	3,4	3,4	5,0
(11) Прочие товарно-материальные ценности	0,5	0,3	0,3	0,5
(12) <b>Фонды обращения</b>	30,9	30,1	29,9	56,2
(13) Готовая продукция	11,1	11,0	11,2	29,8
(14) Товары отгруженные и оказанные услуги	8,5	8,2	8,2	11,8
(15) Денежные средства	6,6	6,0	6,0	7,7
(16) Дебиторы	4,0	3,8	3,5	5,4
(17) Прочие оборотные средства	0,7	1,1	1,0	1,5

[Key]: 1 - 1970; 2 - 1980; 3 - 1985 (forecast); 4 - Proposed structure of working capital

- 5 - Total
- 6 - Including:
- 7 - Working funds
- 8 - Production reserves (raw and other materials, semifinished articles, packing materials, tools)
- 9 - Uncompleted production
- 10 - Expenses for future periods
- 11 - Other commodity and material assets
- 12 - Circulation funds
- 13 - Finished output
- 14 - Commodities shipped and services rendered
- 15 - Monetary means
- 16 - Debtors
- 17 - Other working funds

[Diagram]

# Model of the Technological Cycle and Buildup of Uncompleted Production



The volume of finished output which the production cycle of our country's industry ended in 1983, in conformity with the process being modeled, came to (in percentages of the working capital of enterprises):

$$H = \frac{T(T-1)}{2K} ; 18.4 \frac{8 \times (8-1)}{2 \times 1.5} ; T = 8\%,$$

or  $0.8 \times 182.8 = 14.6$  billion rubles.

Proceeding from the noted equality in the movement of the material resources in the first and second stages of the circulation of production goods ( $M - C$  and  $C^1 - M^1$ ), the reserves of materials, semifinished goods, and articles per production cycle in the country's industry are supposed to constitute 8 percent of the total amount of working capital. The overall amount of production reserves in the working capital of industry in 1983 was at the level of 48 percent, that is, provided for six production cycles.



The volume of finished output to be produced in one production cycle makes it possible to establish also the duration of the cycle itself (t) according to the following formula:

$$t = \frac{360 \cdot T}{P} = \frac{360 \cdot 14.6}{751.3} = 7 \text{ days,} \quad (2)$$

where T is the output to be manufactured in one production cycle; and  
P is the annual volume of industrial output.

Thus, the amount of the production reserves exceeds by six times the resources needed to guarantee the production of output in a single production cycle. Hence it follows that, with the continuous augmenting of the expended producer goods that have been consumed during each production cycle, the existing reserves of material resources in industry could be reduced by a factor of several times, but with the carrying out of a number of financial-economic and organizational measures.

The organization of production with the absolute minimum of reserves in working capital presupposes the placement of the material resources in the mode of the technological stream, and presupposes the complete synchronization of material-technical supply with the enterprises' production cycle, for which it is necessary first of all to reorganize the system of the material-technical supply of the enterprises with the purpose of guaranteeing the even shipment to the consumer enterprises of the materials and articles, and to reduce the interval and volumes of one-time shipments being carried out by the through-shipment form of supply. This task can be resolved provided there is an increase in the scale of supplying enterprises and organizations from the bases of the territorial agencies of USSR Gosnab.

Meanwhile, as has been shown by research, with an increase in the warehouse form of supply there are changes in the volumes and structure of the material resources that are in the reserves. When the needs of the consumers are completely supplied from the warehouses of the supply organizations, the total reserves of resources are reduced to one-fifth to one-fourth, and at the consumer warehouses to one-tenth, with a 5-time increase in them at supply-and-sales organizations and an unchanged level at the suppliers. However, the complete changeover to material support from the supply-and-sales bases is undesirable. Some of the through shipments for the enterprises that consume in tremendous quantities the resources that are being delivered must be retained. One continues to have direct ties (manufacturer to consumer) in the event of shipments for short distances, and also in those instances when the shipping of materials and articles leads to a reduction in their quality.

However, the continuity of material supply will require the shifting of some of the material resources into the sphere of circulation of the supplier enterprises. It is precisely here that one must see the creation of the basic material reserves that are necessary for guaranteeing the continuity of production. The concentration of material resources in the circulation funds of the suppliers will make it possible to establish smoothly operating guaranteed

support in the form of resources (as in the instance with the warehouse form of supply) with considerably smaller reserves of materials as compared with those that are currently in the working funds of the consumers. The operation of the enterprises on the basis of specific work orders submitted by the consumers dictates the need to create an irreducible complete reserve of parts and assemblies for at least 10 days. In this instance the feedback (consumer to manufacturer) becomes flexible, and this contributes to the rhythmic nature of production in both links.

The necessary prerequisites for the reliable providing of the production cycle with all the required materials and articles are created by the commodities reserves in the circulation funds. These reserves are supposed to provide for the needs of the consumers during the period of preparation of production and its switching over to the production of output that provides for the primary needs of the consumers and the completeness of the output to be delivered. With the proper organization of production, that period will be no more than 2-3 production cycles, or 10-15 days (on the average for industry as a whole). At the same time commodity reserves will also form in the enterprises' circulation funds, but it will be necessary to have material reserves for no more than one production cycle.

Thus, as the changeover is made to guaranteed material-technical supply, one will see the preservation of the production reserves being created at the individual enterprises, for purposes of guaranteeing the continuity of production. Therefore the increase in the circulation funds at some enterprises is supposed to be accompanied by the simultaneous reduction of the working funds of others. The correlation between the working funds and the circulation funds will change substantially: the circulation funds will increase considerably, but the working funds will be reduced; the minimal share of the working funds in the working capital, according to our computations, will be approximately 40 percent, and the circulation funds, 60 percent (see table). In the final analysis, some of the social product will change over from the working funds to the circulation funds of all enterprises and supply organizations with the overall reduction of the production reserves.

The practice of concentration of material resources in the circulation funds confirms this. The concentration must be carried out in those limits with which the basic function of the agencies for distributing the material-technical resources would be sales, rather than supply. The changeover to the free sale of production goods (as occurred with the sale of petroleum products) will contribute to the substantial reduction of the demand for them as compared with what happens when they are distributed on the basis of funds. At the same time the re-embodiment of the supply agencies as sales agencies can occur only if there exist the corresponding financial prerequisites, a very important one of which lies in changing the structure of the working capital of enterprises.

One of the steps for improving their structure could be the establishment for the enterprises of a quota for finished output in the amount of the volume of production in 2-3 production cycles (10-15 days). The quota must be formed at the expense of the enterprises' and organizations' own financial resources, and, in the amount that they are unable to cover, by means of bank credit. The

financial and credit resources must be freed from the reserves of commodity-material assets in the working funds and must be joined onto the quota of finished output in the circulation funds.

The fact that enterprises have at their disposal surplus material resources in their working funds is attested to by the instances of their redistribution. According to data pertaining to Mosgormetallosnabsbyt, of USSR Gosnab, approximately 4000 consumers annually fail to pick up approximately 10 percent of the rolled ferrous metals that have been ordered. Thus, the more efficient structure of working capital will guarantee the acceleration of the turnover of production assets, and the continuity and rhythmical nature of production.

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INDUSTRIAL DEVELOPMENT AND PERFORMANCE

INADEQUATE CRITERIA FOR PRODUCT QUALITY EVALUATION FAULTED

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 8, Aug 85 pp 49-55

[Article by Ye. Sapilov, candidate of economic sciences: "Product Quality Evaluation"]

[Text] The transition of the socialist economy to primarily intensive development stipulates the need for constant increase in the quality and efficiency of new equipment. One of the important factors which provides for this is the implementation of tasks which were formulated at a conference of the CPSU Central Committee on questions of scientific and technical progress, particularly the selection of models which are truly better in terms of their technical parameters, quality and economic efficiency for purposes of design and manufacture. In this connection, special importance is attached to quality, keeping in mind the level of contemporary requirements.

Presently, inefficient, technically insufficiently advanced equipment, the standards of which do not meet modern requirements, is frequently still developed and produced. The imperfection of the quality control system, including one of its important elements -- certification -- makes itself evident.

In certifying industrial production, its technical standards, quality and efficiency are evaluated using engineering and economic methods. On this basis, the qualitative structure of the produced items is determined and its change is planned. Thus, on the one hand, certification is an instrument for evaluation of production quality, and on the other, it is a part of the system for planned production management which defines the qualitative parameters of its development.

The methods used to evaluate technical standards and production quality still do not always ensure the selection of truly better types of new equipment, consistent with world standards, for design and production. Certification is often reduced merely to recording the quality category of already mastered output and does not directly influence the quality of development and prototypes. It is essentially based on the standards of manufacturing sectors and this basis, as practice has shown, is rarely objective.



In a number of cases, certification results give distorted information about the quality of output, which disorients planning and does not permit the definition of objective criteria for the material stimulation of collectives to produce output which is truly consistent with world standards, and for the use of penalties for the production of obsolete goods.

For example, in 1983, according to the State Plan, the production of about 300 types of machines, equipment, devices and instruments, which were classified by GKNT [State Committee for Science and Technology] scientific and technical commissions as obsolete, was stopped. However, the majority of these items (85 percent) were certified in the first and superior quality categories, i.e. that which was morally obsolete and subject to removal from production was not recognized by the certification commissions. This fact indicates insufficiently high strictness shown by the commissions on certifiable output and the lack of clear and reliable criteria for classifying it into one or another quality category.

Under conditions of classifying goods into the superior and first categories of quality, a specific requirement of its national economic efficiency is lacking. In result, raising the technical parameters of articles and improving their consumer characteristics is not strictly economically substantiated; the state Emblem of Quality can be awarded even to unprofitable (from the national economic viewpoint) output, the production outlays of which are still higher than ceiling prices.

In classifying production into the superior quality category, such important factors as supplying machines, equipment, devices and complex household appliances with complete sets of adaptations and instruments, the necessary standards of repair servicing of said items, the possibility of obtaining spare parts and consistency of production equipment with modern aesthetic standards, i.e. those factors which directly determine the qualitative standards of production and the degree of the consumers' satisfaction, are not taken into consideration.

To eliminate said shortcomings it is necessary to implement a number of organizational, technical and economic measures and, above all, to improve the methods for determining technical standards, quality and production efficiency on the basis of economic evaluation criteria; to formulate stricter and more specific economic requirements for superior quality goods; to change the organizational structure of certification with the aim of strengthening its intersectorial nature and increasing the consumer's role in evaluation production quality.

To perfect production evaluation it is necessary to refine the term "technical standards of production." In accordance with GOST 15467-79, "Quality Control," it is defined as a relative characteristic of production quality, based on a comparison of the values of indicators which characterize the technical perfection of the evaluated goods with corresponding base values. In our opinion, the technical standards of production should be defined as a comprehensive, quantitative and qualitative characteristic of the technical perfection and the promising nature of engineering (design and technological)

solutions used in it, which express its degree of consistency with the best domestic and foreign achievements.

The principal difference of this definition from the accepted one lies in the fact that it proposes taking into comparison not only the basic indicators which characterize the "output" parameters of the best production, but also the design and technological solutions applied within it. A quantitative comparison of the "output" parameters of certified production with the corresponding base values is necessary, but it is still inadequate for assessing its technical standards. Such a comparison does not show the qualitative, essential features of applied engineering solutions (their progressiveness, novelty, promise), which determine the output scales, the period of effective use and as a result, the economic potential of production.

Current methods for determining technical indicators of one or another item (measuring, registration, estimated, expert, etc.) and a functioning system of scientific and technical, patent and circumstantial economic information permit one to define and compare such individual production parameters as design-engineering and technological solutions applied within it with fairly high accuracy. Thus, as a result, the reliability of evaluation results depends on the base values of the indicators and on design and technological analogs, i.e. on the extent to which they are consistent with the most advanced domestic and foreign achievements.

However, methodical documents on the evaluation of the technical standards of production do not define clear criteria for selecting the base values of indicators, which leads to different and sometimes opposite production evaluations, to non-comparability of results and to the exclusion of reliability control. For instance, in production certification for superior quality goods, it was allowed to use "the best models of similar goods" for a basis of comparison, but not the best domestic and foreign achievements. As a result, the technical standard indicators of the evaluated goods are significantly overestimated.

The evaluation of technical standards can yield objective results only if comparison of technical production parameters is performed with genuinely better indicators, achieved in the design and technology of producing similar goods. Practice shows that no matter how high the technical perfection of the analog selected for comparison, it can not surpass, in all parameters, any of the existing domestic and foreign models. Consequently, it is never possible to confirm with certainty that the given analog is truly better in all of its technical characteristics.

Thus, in evaluating the technical standards of production we should take for a basis of comparison not only the indicators of real models, accepted according to technical parameters as the best of those available in the USSR and abroad, but also the indicators of a conditional "synthetic item" which incorporates the best indicators achieved in similar domestic and foreign items.<sup>1</sup> In this connection, comparison of the technical parameters of both evaluated production and of real models which are accepted as the best analogs with genuinely superior world achievements, which would permit the determination of the value of each parameter relative to the world standard, will be ensured.

The reliability of the evaluation of the technical standards of production depends not only on the selection of values for the parameters of the "synthetic item," but also on the variety of parameters, on the basis of which the comparison will be made. Practice shows that the ministries, the developers of production, to whom the right to establish the variety of technical standard indicators was given, strive to exclude indicators which are "disadvantageous" to themselves in a number of cases.

In the variety of indicators often those very things are lacking which directly determine the value of reduced outlays per unit of production efficiency, which makes estimation of its economic effectiveness and the factorial calculation of the sources of factual economy impossible.

To eliminate these shortcomings, it would be expedient to establish, for specific commodity groups, above all those which are subject to state tests, a variety of basic (four-five) technical indicators on the basis of which comparison with the best achievements should be done when determining the technical standards of the items being produced of projects under development. These indicators (by production groups) should be incorporated within GOST 22851-77, "Selection of Variety of Industrial Production Quality Indicators," and within charts of technical standards and production quality.

As established by the "Uniform Procedure for Systematic Evaluation of the Technical Standards and Quality of Machines, Equipment and Other Hardware and the Certification of this Production by Quality Categories," the evaluation of the technical level of production is a process of continuous control over scientific and technical achievements in designing and producing items and of comparing evaluated engineering solutions with them. The current system of development, drafting and processing of design documentation, which was established by the set of state Uniform System of Design Documentation (ESKD) standards, and the procedure for developing and organizing production output (according to GOST 15.001-73) ensure the possibility of constant supervision over the scientific and technical standards of design and engineering decisions and of production output. However, a number of regulations within the indicated GOSTs need considerable modification.

Charts of technical standards and production quality, which are a basic means of evaluating the technical perfection of design and technological solutions and the selection of the best models, according to the ESKD (GOST 2.102-68, "Types and Completeness of Design Documents"), are not included in the basic variety of design documents and, in relationship to it they act as supplementary informational inquiry material, the preparation of which is an additional duty of the developer.

In connection with the moral obsolescence of scientific and technical information, charts of technical standards and quality need constant modification in the development stages (technical proposals, drafts and technical drawings, working documentation) so that the selection of truly better design and technological decisions be ensured in each of them. Such modification becomes obligatory for the developer and the customer only if



these charts will be transferred from the supplementary category to the basic design documents.

Comparison of production with the best foreign and domestic models only allows us to evaluate its technical standards but not its standards of quality, i.e. not the degree of satisfaction of specific requirements using it. In our opinion, the economic substantiation of national economic requirements and their reflection in technical and economic indicators, which are comparable with production parameters, should be the starting point when determining production quality standards.

By law it was established that the ministry, the customer of machine building production, carries the responsibility for determining the technical and economic indicators in technical specifications for the development of new types of production, as good as the best domestic and foreign models and ensuring its highly efficient use in the national economy.

In connection with this it is necessary, in our opinion, to make a series of changes in the system for preparing and proposing orders for the development and mastery of output, stipulated by GOST 15.001-73, "Development and Organization of Output in Production." This GOST does not obligate the customer to make high demands on production, moreover, it actually encourages the customer to underestimate both his calculations in substantiating parameters and the characteristics of new production, not of long-range national economic requirements, but of similar items made abroad, i.e. indicators consistent with standards already achieved abroad. Thus, "yesterday's" hardware which is becoming obsolete is actually being designed at the technical specification stage and the customer's role in determining the parameters of items designed for him and his responsibility for ensuring their quality are reduced.

This GOST also does not obligate the customer to base his demands on future production from the viewpoint of the optimal satisfaction of national economic requirements and the greatest economic efficiency, in result also freeing him from the responsibility of expressing the national economic interests in developing and mastering production. Such a situation exists because the customer's demands on the production being designed are based not on a national economic requirement, but on the customer's subjective concept of this requirement.

In our opinion, GOST 15.001-73 should obligate the customer to economically substantiate national economic requirements, which are subject to satisfaction within the framework of funds allocated by society towards these goals, and to express it in such quantitative and qualitative terms which would maximally reflect all possible variants of manifestation of individual requirements. In connection with this, charts of technical standards must supplement a graph of "indicators of characteristics of requirements subject to satisfaction by this item," the variety and significance of which are substantiated by the customer in his orders for development.

The inclusion of such a graph into the chart of technical standards and quality has primary importance, since the customer, in defining the public



need for production characteristics, actually becomes responsible for its quality.

Production quality is also determined to a considerable extent by its economic efficiency. According to the current method, the comparative economic efficiency of using new equipment, inventions and rationalization proposals in the national economy is expected to be a comparison of outlays per unit of efficiency in the use of basic and evaluated production. On the basis of such indicators it is possible to determine the advantages of the production types being compared, but it is impossible to establish the extent to which the consumer's demands are met relative to the value of outlays, i.e. it does not characterize the support of the economy by outlays of animate and inanimate labor spent upon a unit of efficiency in accordance with the consumer's requests.

In evaluating production quality, one should consider economic efficiency not only through the value of expected economic effect, but also by means of the proportion of the maximally admissible (ceiling) reduced outlays per unit of efficiency for the consumer to the factual ones, i.e. to those which are achieved by using this item. This indicator characterizes the consumer's degree of satisfaction with the product's ability to reduce labor outlays. It is possible to define it as an indicator of the level of the evaluated item's economic efficiency.

Actual and ceiling reduced outlays for the satisfaction of requirements can be defined according to their general formula. However, it is necessary to establish a level of production cost per unit of work and for the consumer's standard profit from using this product which is expedient from the national economic viewpoint. The creation of a system of economic standards for outlays for the satisfaction of production and nonproduction requirements, with consideration of the final national economic results, is necessary for this. From our point of view, such standards should become a part of the system of progressive technical and economic norms and standards currently being developed for planning the economic and social development of the USSR.

The proposed method for evaluating an item's level of economic efficiency could also be used in its certification. Raising the maximum allowable outlays above or equal to those for the factual should be a necessary condition for production of superior quality goods.

According to the "Uniform System for Systematic Evaluation of the Technical Standards and Quality of Machines, Equipment and Other Hardware and the Certification of this Production According to Quality Categories," the technical and economic standards of a majority of developments and prototypes is controlled by ministry-developers (manufacturers) or through their instruction by leading organizations, i.e. by those who develop and approve technical specifications and technical conditions for production, and establish its evaluation methods and analogs for comparison. Such intrasectorial self-regulation, as experience shows, is not always objective. The fact that more than half the prototypes which are evaluated by the ministerial developers as consistent with the best world achievements do not receive the Emblem of Quality during state certification attests to this.

To increase evaluation objectivity and the control over technical standards, quality, efficiency and the competitiveness of new equipment, the state certification system should also be extended to design and engineering development.

Presently, a new procedure for certifying items in two quality categories, superior and first, has been approved. Production of goods which are not certified within these categories is stopped. However, in this system, in our opinion, the intersectorial nature of certification as the main condition of objectivity in its results, is still insufficiently reinforced. The organization of certification commissions, consisting of representatives of interested ministries and departments, gives them intersectorial status only formally. They can become truly intersectorial when production certification is conducted not according to indicators and analogs established by the developer (or manufacturer), but on the basis of an independent evaluation of each group of production characteristics, which determine its technical standards, quality, efficiency and competitiveness, by ministries and departments whose competency includes the formulation of stipulations relative to these characteristics and control over their implementation.

The representatives of the ministries who are included within the certification commissions should carry the responsibility for the reliability of its results both before the ministry, which approved the certification commission, and before the ministries delegated by them. In the end, the certification commission's work should be reduced to the summary of production evaluations given by commission members in accordance with its groups of characteristics and the presentation of its conclusion for Gosstandart approval. Production certification should be conducted by standing state certification commissions which should be specialized according to production groups and within which must be included representatives of Gosstandart, of the GKNT (for evaluating technical novelty and the promise of engineering solutions and design); of the main ministry which produces the given item (for evaluating the technical standards of certified production and the technological standards of its manufacture); of the item's customer ministry (consumer) (for evaluating standards of quality and economic efficiency); and of the foreign trade ministry (for evaluating competitiveness).

In our opinion, the right to establish the variety and value of indicators for production of superior quality goods, the methods of evaluation and the basic models for comparison, as well as the right to approve the estimates of its economic efficiency and to give recommendations on the sizes of bonus markups in wholesale prices of items with the state Emblem of Quality, should be given to the certification commissions. Members of the certification commissions should have the right to enlist the services of competent specialists of scientific institutions and enterprises in production evaluation.

The work of certification commissions is presently structured on voluntary principles; the participation of sector specialists in it is not repayed and neither the duties of commission members nor their responsibility for the certification results have been determined. The responsibility of certification commission members grows considerably if they are to carry out the function of experts and give conclusions on the consistency of one of

another group of characteristics of production of superior quality goods, on behalf of the ministries and departments which assigned them. To carry out these functions, not only highly qualified specialists, but also substantial outlays of labor and time in gathering and summarizing scientific, technical and economic information are necessary. In connection with this, in order to bolster the interest of specialists in working for the certification commissions, in our opinion, they should be paid for preparing conclusions on production quality.

The evaluation of equipment and production technology, from the viewpoint of production output stability, is not stipulated by the design of the new production certification system.

In the electrical engineering industry, production certification precedes the certification of items into superior and first category which makes it possible to establish the extent of stable manufacturing of said commodity. It would be advisable to extend the experience of the Ministry of the Electrical Equipment Industry and, in the near future, introduce a sectorial certification of equipment, technology and organization of production in the enterprises of industrial ministries.

It would also be expedient to establish a system, in accordance with which the state Emblem of Quality cannot be awarded to an item if the basic technological processes involved in its production do not meet the best domestic and foreign achievements.

#### FOOTNOTE

1. The concept of a "synthetic item" is used, for example, in the practice of determining production quality standards in GDR industry. See "Kachestvo i Standartizatsiya" [Quality and Standardization], edited by Kh. Liliye, Ekonomika, Moscow, 1982, p 110

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## RESOURCE UTILIZATION AND SUPPLY

### HIGHLIGHTS FROM GOSPLAN CONFERENCE ON RESOURCE CONSERVATION

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 9, Sep 85 pp 53-61

[Article by V. Korolev, deputy chief of a department of the USSR Gosplan:  
"Planning Conservation of Physical Resources"]

[Text] In June 1985, a production conference of associates of the Gosplan and scientific research institutes of the USSR Gosplan, which discussed tasks with regard to further improving planning conservation of physical resources in the light of the decisions of the 26th CPSU Congress and the April (1985) plenum of the CPSU Central Committee, was held in the USSR Gosplan.

The purpose of the conference was to raise the activity of specialists and scientists in the matter of fundamental improvement of work with regard to conservation and efficient use of resources in all links of the national economy and to promote mobilization of their knowledge and efforts in pursuing a resource economizing scientific-technical and structural policy and improving the system of management, planning and stimulation.

The conference was opened by S. A. Sitaryan, deputy chairman of the USSR Gosplan and corresponding member of the USSR Academy of Sciences. He stressed that defined by the Communist Party as the most important direction of steady upsurge of the national economy is acceleration of its conversion to a primarily intensive path of development, efficient use of the created production potential and all possible conservation of physical, manpower and financial resources. One of the main tasks facing the Gosplan collective in connection with the development of draft plans for 1986 and the 12th Five-Year Plan is improving work in revealing reserves for conservation of physical resources and reflecting it in plan calculations, forming scientifically substantiated tasks with regard to raising efficiency in utilization and conservation of raw materials, materials, fuel and energy, practical preparation for fulfilling these tasks in ministries, departments and at every enterprise and control over the soundness of the system of physical norms and standards.

The report "Conservation of Physical Resources--the Most Important Condition for Intensifying Development of the National Economy" was delivered by K. V. Malakhov, member of the USSR Gosplan Collegium and chief of the Material Balances and Distribution Plans Consolidated Department.



The report described fulfillment of resolutions which were adopted in the past few years by the CPSU Central Committee and the USSR Council of Ministers with regard to conservation and efficient utilization of resources. At the present time, tasks for conservation are set for approximately half of physical resources (in value terms) distributed by the Gosplan. Calculated according to rates of consumption are 90 percent of metal requirements in machine building, nearly 100 percent for boiler-furnace fuel, 60 percent for electric energy and 50 percent for heat energy. An order of annually reviewing the rates of consumption per unit of production by taking into account the results of their fulfillment in the preceding period has been introduced.

During the past few years, measures have been provided for strengthening stimulation of conservation of physical resources on a state scale. Specifically, the range of physical resources, for conserving which bonuses are paid, has been substantially expanded and the circle of workers being awarded bonuses has also been expanded. The interest of production associations and enterprises in increasing the output of production from by-products, secondary resources and local raw materials has increased.

In 1984, R900 million in savings was obtained by reducing physical input (without amortization).

At the same time, the expenditures of steel, lumber, cement, oil, gas and coal for the production of a unit of national income are still unjustifiably great.

Thus, the metal utilization ratio in machine building remains low (1983--0.761), that is every fourth ton of metal goes into waste. Utilization of ferrous rolled stock is particularly low in the automotive (0.697) and electrical equipment (0.682) industries. Increasing metal utilization ratio to a leading level will make it possible to reduce its expenditure by at least 4 million t a year. The relative structural metal volume of domestically produced machines and equipment calculated per unit of leading parameter is 20-25 percent higher than of best world models. Remaining particularly of great metal volume are wheel tractors and agricultural machines, the mass of which can be considerably reduced (up to 30 percent), equipment for the light and food industries, trucks and other production. The additional expenditure of metal, connected with the increased metal volume of goods, is estimated at 5-6 million t a year.

Some machine building ministries do not ensure fulfillment of the established tasks for conservation and permit setting of expenditure norms too high. In 1984, the Minavtoprom [Ministry of the Automotive Industry] fulfilled the task for reducing the norms by only 62 percent and overexpended 73,000 t of rolled stock. There are facts of expenditure norms being set too high at many enterprises of this ministry. Norm setting, accounting and safekeeping of pipes are poorly organized in extractive sectors of the industry. As a rule, pipes in volumes that exceed the planned requirement are delivered to drilling rigs, and after completion of work the remaining pipes are illegally written off. Moreover, pipes are inefficiently expended for casing nonproductive wells, lowering of flow tubing to depths considerably below the productive strata and for making of racks, flooring, pile foundations and frameworks of buildings.

Serious shortcomings are being permitted in the production of economical kinds of metal products, rolled metal substitutes and steel pipes. The unrealized reserves of metal conservation by virtue of improving the supply of this production to the national economy amounts to approximately 3 million t in the current five-year plan.

To maintain equipment in efficient working condition some 22-23 million t of metal products are expended annually. Meanwhile, according to calculations by scientists, the annual overexpenditure of metal for these purposes is estimated at 9-10 million t. This is caused by the existence of a considerable quantity of obsolete equipment, low rates of its replenishment, insufficient reliability and durability of many kinds of equipment and spare parts, unsatisfactory condition of the repair base and organization of repairs and violation of the rules for storage and operation of equipment.

It has been calculated that the national economy loses approximately 25 million t of metal annually from corrosion in goods and structures, whose break down causes a damage of nearly R60 billion. One of the effective means of protection against corrosion is the use of galvanic coatings, but its broad introduction is restrained owing to insufficient production of automated equipment by the Minstankoprom [Ministry of the Machine Tool and Tool Building Industry].

A considerable share of the aforementioned losses occurs owing to insufficient supply of production with paint, varnish and polymer materials, bitumen, synthetic rubber and latex and rubber and industrial asbestos materials. The responsibility for satisfying the requirement in this production has been placed on the Minkhimprom [Ministry of the Chemical Industry] and the Minneftekhimprom [Ministry of the Petroleum Refining and Petrochemical Industry] of the USSR.

In the first 4 years of the five-year plan, the Minenergo [Ministry of Power and Electrification] of the USSR, the Minchermet [Ministry of Ferrous Metallurgy] of the USSR, the Minlesbumprom [Ministry of the Timber, Pulp and Paper and Wood Processing Industry] of the USSR, the Minlegprom [Ministry of Light Industry] of the USSR and the Minudobreniy [Ministry of Mineral Fertilizer Production] have failed to fulfill completely their tasks for conservation of boiler-furnace fuel. In 1984, its overexpenditure above the established norms was permitted by every seventh enterprise of the USSR Ministry of Power and Electrification, every tenth enterprise of the USSR Ministry of Ferrous Metallurgy and every fifth enterprise of the Ministry of Mineral Fertilizer Production. In this case it should be noted that the share of the aforementioned ministries accounts for more than 50 percent of overall fuel consumption in the country as a whole.

Large reserves of physical resource conservation exist in chemistry, petrochemistry and extractive sectors. Calculations show that with complete mastery of reserves in comprehensive processing of raw materials in the ore mining industry there is a real possibility of increasing the volume of production by 25-30 percent without substantial capital and labor input and of annually obtaining additional production valued at more than R20 billion.

By-products of coal enrichment, some of which should be used for obtaining silicon-aluminum alloys, are still great at coal industry enterprises.

Possibilities of extracting cobalt, copper and other valuable components during comprehensive iron ore processing are not being used in ferrous metallurgy.

The share of secondary resources in the country's raw materials balance can be increased severalfold.

Thus, only 10 percent of the resources of secondary polymeric raw materials are drawn into production for the second time. Procurement of exhausted galvanic cells and household radio electronic equipment for the purpose of extracting nonferrous metals has not been organized.

Approximately a third of worn out tires are used as a secondary raw material, although the volumes of their formation have been increasing and amount to over 1 million t annually.

Our country occupies a leading place in the world with regard to the procurement and export of timber, which, however, is not being processed efficiently enough. A large quantity of waste is allowed in this sector, of which only 50 percent is used for the manufacture of production. Production of plywood, paper, cardboard and wood fiber and particle boards can be substantially increased without increasing the volume of timber procurement. Still another reserve--wood from felling and care of forest plantings, which for all practical purposes is not being taken into account in balance resources. Waste paper for the production of cardboard is not being utilized in full measure.

The light and food sectors of the industry are among the most materials-intensive in the national economy. Every percent of reduction of physical input in these sectors amounts to R1.4 billion a year.

A considerable share of physical resources is directed into agriculture. The overall amount of physical input in it (without amortization) exceeds R60 billion a year. Agricultural and light and food industry specialists must improve work with regard to establishment of expenditure standards and planning conservation of physical resources, and not permit their inefficient utilization.

For efficient utilization of physical and fuel-energy resources a new approach is required to systematic and organized support of this work. The expediency of shifting in planning of physical resources according to generalized indicators of efficiency of their utilization per unit of final product is obvious. For example, in machine building the expenditure of rolled metal products should be planned per R1 of commodity production. In this case the tasks for conservation of the kinds that are in most short supply must be included in the number of confirmed indicators and in conditions of the economic experiment.

In the 12th Five-Year Plan, a great part of the increased requirement in ferrous rolled stock, lumber and other materials must be ensured by virtue of their careful and efficient utilization as well as increased production and use of more economical kinds of this production. It is planned to obtain the entire increase in the volumes of construction and installation work and production in machine building through more economical and efficient utilization of ferrous rolled stock.

The 12th Five-Year Plan must reflect most effective means of economical and efficient utilization of physical resources and strengthening the role of scientific and technical progress in ensuring resource economizing management of every sector and every enterprise and construction project.

M. N. Gorshkov, chief of a subdepartment of the Five-Year Plan and Annual Planning Consolidated Department and candidate of economic sciences, devoted his speech to questions of interconnection of intensification of production and reduction of its material-intensiveness. The April (1985) plenum of the CPSU Central Committee stressed the necessity of improving the structure of social production in order to raise its efficiency, increase labor productivity and reduce material-intensiveness.

In industry this must be expressed, first of all, in much higher rates of growth of processing sectors compared with the fuel-raw material ones. Improvement of the sectorial structure will make it possible to reduce the physical input by approximately R3 billion or by 10 percent of the overall volume of reduction of material-intensiveness of industrial production.

Raising the rates of growth of sectors, which determine the technical progress of machine building and chemical industry, becomes the main factor in improvement of the sectorial structure. For these purposes it is necessary, first of all, to comprehensively utilize raw materials, broadly introduce waste-free and low-waste manufacturing methods and reduce material-intensiveness of mass production.

Comprehensive processing of nepheline raw materials makes it possible to reduce the production cost of alumina by 15 percent and of cement by 10 percent. Solution of this task only at the Mikhaylovskiy Mining Enrichment Combine in the 60th Anniversary of the USSR would make it possible to save more than R250 million in capital investments. The Pikalevo Alumina Production Association and the Achinsk Alumina Combine are producing alumina, cement and soda and have reduced waste to a minimum. However, the level of comprehensive processing of nepheline raw materials as a whole has not been rising in the current five-year plan.

The questions of extracting phosphate fertilizer during mining of iron ore in Kazakhstan and of titanium dioxide from Ural bauxite and iron ore are being solved slowly.

Reduction of material-intensiveness and improvement of structure is restrained to a great extent owing to slow introduction of economical manufacturing methods. Capital investments are often directed at final building work of enterprises, which have been planned according to old technology. Questions of efficient utilization of physical resources have not yet become an organic part of plan development technology.

R. A. Kozhevnikov, chief of a subdepartment of the Science and Technology Consolidated Department and candidate of economic sciences, concentrated the attention of conference participants on the problem of planning scientific and technical progress as one of the main factors of material-intensiveness of pro-



duction. It is precisely for these purposes that the proposals, which are presented for inclusion in the plan for development of science and technology, are considered with mandatory appraisal of indicators such as material-intensiveness, power-intensiveness and conservation of critical materials.

In preparation of the draft plan for 1986 and the 12th Five-Year Plan it is necessary to provide for a system of generalized indicators, which characterize the relative share of production of new material-and power-economizing kinds of goods in the overall volume of production, the level of utilization of materials (ferrous and nonferrous rolled stock utilization ratio) and relative expenditures of materials, fuel and power per unit of capacity or other technical parameter.

During development of scientific and technical programs, the effectiveness of proposed measures was quite often appraised by a potential effect without indicating specific places and periods of its achievement. It is impermissible to use such appraisals for real planning of resources.

In coordination with plan indicators a state program was organized in a new way in the field of raising the utilization efficiency of physical and raw material resources. Unfortunately, an analysis of the data received by the USSR Gosplan testifies that in some cases there have been considerable deviations from the tasks of the program. Thus, in the proposals of the Minenergomash [Ministry of Power Machine Building] conservation of ferrous rolled stock amounts to only 65 percent and of the Minelektrotekhprom [Ministry of the Electrical Equipment Industry] conservation of rolled steel pipes to a little over 50 percent.

A central element in the speech by L. S. Krylkov, chief of a subdepartment of the Finances, Costs and Prices Department, was substantiation of the necessity to improve planning of physical input. This is a complex task, taking into account the fact that physical input in production costs amounts to an average of 75 percent.

If physical input is taken as 100 percent, then raw materials and materials amount to 73.9 percent, purchased semimanufactures to 16.1 percent, services of a production nature to 1.2 percent, fuel to 5.3 percent and expenditures for heat and power to 3.5 percent. However, the USSR Gosplan plans only about 20 percent of the overall cost of raw materials and materials, for half of which centralized tasks for economy are established. In this case approximately 10 percent of the physical input is regulated. In order to raise the utilization efficiency of other physical resources, the work of the Gosplan's sectorial departments and of corresponding ministries must be substantially strengthened.

It should be noted that economic science has not prepared reliable methods for substantiating amounts and dynamics of physical input, which could be used during preparation of a five-year plan.

For the purpose of raising the substantiation of plan calculations and conservation of raw materials, materials, fuel and power it is necessary to shift to formation of production balances and distribution of production in physical and cost indicators and to organize this work by taking into account the economic efficiency of measures with regard to plans for development of science and

technology and improvement in the organization of production and material and technical supply. It is expedient to create a system of information on the value of resources and to use it in calculating norms and standards, production volumes and indicators of labor intensiveness and material-intensiveness.

There is an urgent need to solve questions systematically and in an organized manner with regard to coordination of value and physical tasks of a plan as well as stimulation of enterprises for accelerating the mastery of planned capacities and normative levels of technical and economic indicators.

A. G. Myagkikh, senior expert of the Norms and Quotas Department, dwelt in his address on the important questions of improvement of the quota base of physical resource planning.

During the years of the 11th Five-Year Plan, the number of holders of capital, for whom conservation tasks are confirmed, has considerably increased and the range of indicators and directions of norm setting has expanded.

At the same time, the system of conservation indicators has become unjustifiably cumbersome. It does not always contribute to raising the level of efficient resource utilization and restricts independence of enterprises and ministries in maneuvering them. In the state plan for 1985 the Minavtoprom [Ministry of the Automotive Industry] is set more than 50 tasks and indicators for metal conservation and the USSR Ministroymaterialov [Ministry of the Construction Materials Industry] more than 100 for boiler-furnace fuel and heat and electric energy.

Conservation indicators are regulated in the main by measures directed at reducing direct relative technological expenditures for specific kinds of production. At the same time, there is no clear differentiation between planning efficiency in utilization of resources and work with regard to formation of norms and tasks for their average reduction. An attempt to achieve a rise in efficiency and balance of plans with physical resources by means of reducing expenditure norms alone gives rise to an unjustifiable urge to set them too high and to distort plan indicators for volumes and production structure in order to conceal the real reserves and to subsequently create an appearance of an active struggle for conservation. Insufficient consideration is devoted to the influence on efficient utilization of raw materials, materials, fuel and energy of the structure and variety of production as well as of work, its quality, reliability, specialization and cooperation of production and utilization of secondary resources.

Conservation indicators, for example, of metals (including ferrous metals) and rolled metal products duplicate each other to a considerable degree. For the first time in 1985, the USSR Gosplan confirmed norms for the expenditure of ferrous rolled stock per R1 million worth of machine building commodity production. They are oriented toward the necessity of raising the independence and responsibility of ministries and enterprises in the matter of economical and efficient utilization of physical resources. Changes have been made in some state standards, which provide for indicators of relative material-intensiveness and power-intensiveness among the basic technical parameters.

The practice of confirming integrated physical and physical-cost indicators in state plans and of specific material expenditure characteristics in standards should be expanded. It is expedient to make material-intensiveness and power-intensiveness indicators of the national income from calculations as planned ones and to regard them as a starting base for planning development of sectors.

The need to improve planning of conservation by virtue of improving production structure and technical-economic and operational parameters of machine building production was revealed in specific examples by V. A. Shumayev, senior expert of the Machine Building and Inter-Branch Production Consolidated Department and candidate of economic sciences. Attention was devoted here to substantiation of the growth of individual and group norms of expenditure of materials in those cases when it was accompanied by reduction of their expenditures per unit of a product's leading technical parameter.

A. Ye. Yurchenko, chief of the Utilization of Secondary Resources Department, devoted attention in his address to the problem of expanding the use of secondary resources as an important factor in conservation of raw materials, materials, fuel and energy.

It is planned to considerably increase the volume of utilization of waste paper, wood waste products, refuse glass, worn out tires, secondary polymer raw materials and other kinds of secondary raw materials and to annually conserve through the use of secondary resources a considerable quantity of timber, soda ash, synthetic rubber, natural and synthetic fibers, fuel, natural gas, cement, gypsum, crushed rock and quartz sand. It is planned to use dry shale ash (phosphogypsum) in liming acid soil for the purpose of raising its productivity.

It is necessary to provide in the draft of the five-year plan for a maximum possible expansion of production capacities for processing of secondary raw materials and for delivery of waste products of some sectors for use as secondary raw materials in other sectors.

It must be borne in mind that any reduction in the volumes of waste products utilization against control figures will lead to an overexpenditure of critical resources. Nevertheless, there are cases when such proposals are submitted. This applies, for example, to pyrite cinders for cement industry, phosphogypsum, worn out tires and secondary nonferrous metals.

It turned out that it is simpler to design a galvanic cell processing technology for the extraction of zinc and mercury than to organize collection of used batteries. The USSR Mintorg [Ministry of Trade] categorically refuses to accept them, even if approximately 70 percent of galvanic cells are being sold through the trade network.

In order to actually draw secondary resources into economic turnover, it is necessary to combine the efforts of manufacturers of production as well as its consumers and to increase their responsibility for fulfillment of plan indicators.

M. M. Pchelin, chief of a subdepartment of the Balances and Plans for the Distribution of Fuel and Power Resources Consolidated Department, dwelt on the problem of conservation of fuel and power resources.

It is provided that along with input norms and tasks for their average reduction, indicators will also be established from now on for fuel-intensiveness, power-intensiveness and heat-intensiveness of commodity production, which will make it possible to deeply analyze the work of sectors and to motivate them toward active introduction of achievements of scientific and technical progress.

The April (1985) plenum of the Party Central Committee and the June (1985) conference in the CPSU Central Committee on questions of accelerating scientific and technical progress devoted attention to improving the structures of production. Project planning for 12th Five-Year Plan tasks in power-intensive sectors such as the construction materials industry, energy, ferrous metallurgy, chemistry and petrochemistry, that is where approximately more than 70 percent of fuel and power are being consumed, must be oriented to a greater degree toward their conservation by virtue of improving technological processes and the structure of goods being produced. Thus, by improving the structure of metallurgical production it is possible to achieve a reduction in the rate of consumption of standard fuel from 627 kg per t to 600 kg. Matters must also be set right in the construction materials industry, where no substantial reduction in the rate of fuel consumption for firing cement clinker is planned owing to low rates in the increase of cement production by the dry method.

It is necessary to additionally examine the state of affairs with energy conservation in these sectors and to implement measures aimed at improving the structure of production for the purpose of reducing power-intensiveness of sectors and of the national income as a whole. We must also accelerate construction of plants that produce energy-saving equipment and devices. We must provide efficient monitoring of energy resource consumption by massive incorporation of this technology during the 12th Five-Year Plan.

Some questions of efficient utilization of metals were raised by A. I. Gurin, chief of a subdepartment of the Motor Vehicle, Tractor and Agricultural Machine Building and Machine Building for Animal Husbandry and Fodder Production Department.

A sectorial comprehensive program for conservation of ferrous metals in agricultural machine building, including by raising the quality and utilization of economical sections 6.3 percent, rolled metal substitute 0.7 percent and introducing progressive technological processes 6.1 percent, was developed and confirmed for 1981-85.

For the purpose of coordinating work in conservation of physical resources and pursuing a unified scientific and technical policy, an administration of new materials and physical standards has been established at the Minsel'khosmash [Ministry of Tractor and Agricultural Machine Building]. Practical decisions are adopted by the Commission for Conservation of Power, Fuel, Raw Materials and Metals under the supervision of the first deputy minister.

The Ministry of Tractor and Agricultural Machine Building and the Minchermet [Ministry of Ferrous Metallurgy] of the USSR have developed and are putting into practice joint programs for designing, mastering and introducing effective kinds of metal products, which ensure an increase in the technical level and reliability of machines and conservation of metal during their production and operation.



The Minzhivmash [Ministry of Machine Building for Animal Husbandry and Fodder Production] has developed a comprehensive special-purpose metal conservation program. Broad introduction of advanced equipment for obtaining unfinished work pieces, which approximate to the maximum a finished component with regard to form and size, has made it possible to increase production of unfinished work pieces and components by the plastic deformation method according to low-waste technology to 32.6 percent against 23.2 percent in 1980. Through introduction of metal-economizing manufacturing methods at plants of the aforementioned sector the conservation of rolled metal products amounted to 133,700 t against the task of 115,800 t in 4 years of the 11th Five-Year Plan.

At the same time, there are shortcomings in metal conservation work. Requirements in progressive kinds of metal products and their substitutes are still not being fully satisfied and unproductive losses of rolled metal products are high as a result of substitution of brands, grade sizes and some kinds of materials with other kinds. Lagging is permitted in the volumes of utilization of low-waste and waste-free manufacturing methods, and rolled metal products utilization factors remain low in the 11th Five-Year.

S. P. Pavlov, deputy chief of the Construction Materials Department, elucidated construction materials conservation tasks. Under the contemporary scale of capital construction only 1 percent of materials conservation will make it possible calculated per year to save 1.3 million t of cement, 3 million m<sup>2</sup> of glass and more than 80 million standard slate tiles, which is enough for the construction of more than 3.5 million m<sup>2</sup> of general living space. Careful and diligent attitude toward all kinds of construction materials leads in the final analysis to conservation of fuel and electric power and reduction of transportation expenditures. More than 22 million t of standard fuel and approximately 14 billion kW-hours of electric energy are expended for the production of cement. Only by adhering to elementary order during warehousing and storage of construction materials and structures at construction sites will make it possible to obtain a saving of approximately from 1.5 to 2.5 percent of their overall expenditure.

Approximately 30 ministries and departments produce crushed rock in which impurities amount to from 10 to 15 percent. Every percent of dust in crushed rock, gravel and sand requires an additional 2 percent expenditure of cement. Therefore, overexpenditure of cement for this item alone amounts from 20 to 30 percent.

Conservation of materials must proceed in two directions. The first is raising good working conditions with high standards of production, adhering to technology, strengthening control over fulfillment of material conservation tasks and adopting measures aimed at eliminating discovered shortcomings. This work has been somewhat stirred up in the current five-year plan. Commissions for efficient expenditure of physical resources have been organized in many ministries. As a result, in the past few years it has been possible in construction, for example, to reduce the expenditure of glass by 30 percent and of cement by 13 percent.

The second direction is conducting major sectorial measures for conservation of materials, which require capital expenditures and must be reflected in

five-year and annual plans for production and capital construction. For example, designing capacities for production of qualitative inert aggregates of concrete mixes.

V. I. Pavlov, chief of a department of the NIIPiN [Planning and Norms Scientific Research Institute] of the USSR Gosplan, has recommended for the purpose of strengthening the policy of conservation to analyze the content of normative acts now in force, which regulate material consumption in the national economy and stimulation of reduction of physical input, eliminate contradictions in these documents and completely coordinate them with each other. Apparently, limits of physical input per R1 of commodity production should be established in the plan for all ministries, associations and enterprises, including for those participating in the economic experiment. This will make it possible to balance physical and cost indicators of volumes of production and physical and technical resources.

The conference adopted comprehensive recommendations, addressed to subdivisions of the USSR Gosplan, specialists and scientists. The document outlines measures for further improving the normative base of planning and raising the mobilizing role of norms, fixed standards and requirements of ministries and departments in organizing work with regard to conservation of raw materials, materials, fuel and energy.

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## ECONOMIC MODELING AND COMPUTER TECHNOLOGY APPLICATION

### COMPUTERS TO AID RESOURCE ALLOCATION INTRODUCED IN BSSR

Moscow MATERIALNO-TEKHNICHESKOYE SNABZHENIYE in Russian No 8, Aug 85  
pp 71-73

[Article by I. Pazhoga, chief engineer, BSSR Gosnab /State Committee for Material and Technical Supply/: "Computers Will Help Us"]

[Text] The effectiveness of utilizing material resources depends, to a large extent, on the correct determining of need, distribution of allocated funds, precision in accounting, along with monitoring controls over the expenditure of raw materials, other materials, fuel and energy. Experience has demonstrated that the "manual" method of planning and administering supplies is inefficient. Therefore, the enterprises and organizations of the BSSR Gosnab are introducing a more improved system, based upon the use of third-generation computers and up-to-date methods of forecasting.

At the present time computers in industrial use are solving 67 problems for the following associations: Belmetalloznabyt, Belinstrumentnabyt, Belkhimnabyt, Belelektroznabyt, Belradiopribornabyt, as well as the central apparatus of the republic's Gosnab. As a result, the specialists obtain data for determining, needs, distribution, and the implementation of funds for production-technical types of output, monitoring controls over the performance of contractual obligations with regard to product deliveries, as well as other information being used in analyzing the financial-economic activity of the supply-and-sales organizations.

For example, the status of metal-product deliveries is monitored by the Belmetalloznabyt both in the specified as well as in the enlarged products list. The automated accounting of the performance of contractual obligations is conducted in a cross-section of the positions of the plan documents (on certain types of products also in a cross-section of rolling mills), based on the commodity-transport warehouse and storage requirements of the suppliers with a monthly periodicity or at the request of the association. The plan, the actual indicator, the deviation from the plan, and the percentage of its fulfillment are all counting on an increasing result from the beginning of the year and the quarter for each position of the plan document. During the course of the year an automatic adjustment of the documents is to be carried out.

Moreover, at the Minsk enterprise for deliveries of this association's metal products Robotron-1711 bookkeeping-invoice automatic units have been installed. They ensure a mechanized processing of incoming and outgoing documents along with the acquisition, at the same time, of a mechanized carrier, which has been added to the computer without any additional adjustment. Based on data from perforated tapes, a data base is formed, and it is used for solving problems of bookkeeping accounting and monitoring control over the deliveries of metal products.

This year the Minsk enterprise engaged in deliveries has also installed an ES-9003 multi-board system for preparing data on magnetic tape. This has allowed us to reduce the time spent on preparing information by 40--45 percent, the number of mistakes--by half, and to increase labor productivity by 35 percent.

A great deal of attention has been paid in the operating practice of Belkhimsnabsbyt to improving the supply system and increasing its effectiveness with the use of mathematical-economics methods and computer equipment. With the help of computers here they have successfully introduced an automatic system of accounting for the deliveries of chemical products to this republic's enterprises and organizations. During the years which have elapsed of the current five-year plan the board's workers have adopted and analyzed the forms of the performance balances and the reference manuals for them. In conjunction with the Republican Computer Center of BSSR Gossnab, Belkhimsnabsbyt's specialists have studied the preparation of incoming documents and the derived data in order to formulate normative-reference information and calculations of the performance balances with the help of computers, based on the information presented by this republic's enterprises.

A calculation has been made of the economic effectiveness resulting from introducing the system of performance balances. The industrial operation of the complex was begun last year. The calculations conducted with its help permitted Belorussia's enterprises to reduce stocks for the current year by 36 tons of polyamide, 100 tons of trichloroethylene, and 40 tons of monoethanolamine. This comprised approximately 4 percent of the republic's needs. The Belkhimsnabsbyt workers have been encouraged by USSR Gossnab to successfully introduce a complex of tasks into the system for calculating the performance balances with the help of computers. In order to utilize metal products effectively and economically, an analogous system is being introduced at the Belmetallosnabsbyt.

Responding by deeds to the decree of the CPSU Central Committee and the USSR Council of Ministers concerning the strengthening of delivery discipline, the enterprises have begun to more rigorously observe their contractual obligations. Deliveries of many types of products to other economic regions of the country and for export are being carried out. BSSR Gossnab has adopted additional measures to improve planning and provide the national economy with material resources. Particular attention is being accorded to the unconditional observance of the contractual obligations by the supply-and-marketing organizations, as well as to the effective switching around of material resources.

For these purposes, the accounting and monitoring of performance on the obligations with regard to the warehouse and transit deliveries of products is



Thus, in 1983 a complex for solving problems connected with delivery accounting was introduced in the Belmetallo snabsbyt. It provides for the formation and printing of 36 machino-grams, of which 24 are published in the specified and enlarged products list. Last year developmental work was begun on the task entitled "Accounting for the Performance by the Supply-and-Marketing Organizations of Obligations with regard to Warehouse Deliveries in accordance with the Concluded Contracts and Orders" for the Belinstrumentsnabsbyt and Belkhimsnabsbyt. The control examples have now been checked out, and the experimental operation of the computer has begun.

At the present time an experiment is being conducted with regard to making the delivery plans available to the performers. The Belavtomaz Production Association has been specified as the facility. The purpose of the experiment is to develop an inter-action between the republic's Gossnab and the production associations, the enterprises and organizations engaged in making deliveries in forming the plans for deliveries, effective monitoring and regulating them via the informational system of USSR Gossnab. This permits us to achieve a balanced quality in the plans for deliveries, production, and supply, to take timely measures for fulfilling the terms of contracts and orders, to upgrade the role and responsibility of Belorussia's Gossnab for strengthening delivery discipline.

In order to monitor the current quality of balance between the delivery plans and the material-technical resources, the republic's Gossnab and the BelavtoMAZ Association have included in the experiment a demonstration-order control on the deviations on the shipping out of certain types of materials and sets of items to the associations. A joint operational plan for conducting the experiment has been developed and approved. Preparation is now under way to solve such an important problem as the following: "Monitoring the performance of contractual obligations in delivering products to the BelavtoMAZ."

Significant work is being conducted with respect to automating the control of warehousing processes. Three Robotron-1840 minicomputers have been put into operation at the Minsk enterprise engaged in delivering tools and bearings. By means of this, provisions have been made to reduce labor consumption and increase the labor productivity of workers, engineers, technicians, and clerical employees by 20--25 percent, to speed up the turnover of material resources by 4--5 days, to lower expenditures for maintaining supplies by 42,000 rubles, as well as sharply raising the standards of warehousing and utilizing the possibilities of ACS /automatic control system/ in the matter of strengthening the discipline of product deliveries.

At the present time work is being done on developing a system for the automatic control of the warehouse freight processing of products at the Limeks Warehouse of the Fanipolskiy enterprise engaged in deliveries of the Belkhimsnabsbyt's products. Work is continuing on creating and improving ACS's in the boards of the Belelektrosnabsbyt, Belradiopriborsnabsbyt, and planning the information-reference system of the BSSR Gossnab.

In order to introduce the means of mechanization and automation into the supply-and-marketing organizations, an integrated journal-order form of accounting has been introduced along with an operational-bookkeeping method of

accounting for commodity-material prices. Work has been completed on putting into practice standardized and integrated forms of preliminary accounting documentation.

Bookkeeping accounting has been centralized in associations, administrations, and at enterprises of the republic's Gosstab. As a result of the work which has been conducted the following operations have been mechanized: accounting for the movement of commodities, fixed capital assets, calculations with suppliers and customers, sales of goods, as well as computing the wages for workers in the supply-and-marketing organizations.

The time periods are constantly being reduced and the expenditures being lowered on data processing. For this purpose the computer center has developed and introduced a special program for inputting incoming information. The program for converting sets of data has been improved; by means of this the reliability of the data being published has been increased. Programs have been created for selecting, replacing, and sampling, as well as a corollary program which allows this process to be speeded up by 30 percent. The ES-1022 multi-program operating system has been introduced, and a system for depicting information on on electronic-ray tubes (eight boards). In order to increase the functional effectiveness of the computer center, a comprehensive system for controlling product quality has been developed and introduced, based on the enterprise's standards with respect to all types of its production activity.

Last year we put into industrial operation the ES-1035 computer, which significantly increased the computer center's production capacity, and the ES-9003 SPD [data-preparation system], which allowed us to increase labor productivity in preparing incoming data.

The use of computer equipment has brought about good results. During four years of the current five-year plan more than 500,000 rubles have been saved. If in 1981 approximately a million tons of by-products of production and consumption were reprocessed in this republic, last year this amount increased by almost 20 percent and came to more than 1.2 million tons. Tens of thousands of rubles worth of slow-moving and shopworn commodity-material items were sold.

As a result of implementing the measures with regard to improvement of the organizational structure of administration in the sub-departmental supply-and-marketing organizations during this time, 116 units of the administrative-control apparatus were cut back, with a wage fund of about 130,000 rubles. Above-norm reserve supplies of commodity-material items worth a total of more than 230 million rubles were put into economic circulation.

The automated reckoning up and charging of penalty fines in the Belmetallo-snabst along during the years 1982-1983 has let us extract more than 10 million rubles from the suppliers. In this connection, just during a single year the shortfalls in metal deliveries were reduced by more than one half.

The technology which has been developed for solving the problems of ACS has allowed us to regulate the work of the administrative apparatus, to discover

new sources for increasing the productivity of administrative work. While metal turnover during the course of 15 years has grown by a factor of 1.7, and the number of functions being performed has doubled, the number of the Belmet-allosnabsyt's commodity divisions has remained unchanged.

Moreover, the utilization of computer equipment for solving ACS problems has allowed us to conduct a more profound analysis of the production-management activities of the enterprises and associations. It has become possible to set up the proper controls for monitoring planning-financial discipline, as well as to effectively solve the problems of supplying the republic with material and technical resources. Because of the increase in the proportion of analytical projects based on information obtained from the computer, there has been an improvement in the quality of administrative work.

The introduction of mathematical-economic methods and computers into the operational practice of supply-and-marketing organizations has improved the technology of processing economic information. This has made it possible for the supply organizations to place monitoring controls over the furnishing of supplies to plants, particularly important construction projects, and start-up facilities, as well as effectively switching material resources around.

Considerable amounts of work with regard to creating new automated systems and improving the administration of supplies, based on the use of computer equipment, are intended for the 12th Five-Year Plan and for the period extending up to the year 2000. Concrete goals have been specified along with basic directions and amounts of work. Thus, in the immediate future BSSR Gossnab intends to make the transition from a comprehensive system of data processing to a comprehensive administrative-control system, based on the data which have been processed. Provisions have been made to bring the direct users of the information as close as possible to the technical means of communication in the system, and likewise to introduce a comprehensive system of controlling product quality with respect to the basic directions of the activity of this republic's Gossnab.

In speaking about the successes in creating automatic control systems for supply operations, we must not remain silent about the problems which must be faced. It is well known, for example, that the effectiveness of supplying the national economy is determined by the level of warehousing operations. Unfortunately, the existing material-and-technical base at several enterprises engaged in delivering the BSSR Gossnab's products does not meet present-day requirements. This creates difficulties in administering supply with the help of computers. Therefore, we consider that the fundamental problem of increasing our work's effectiveness is the creation of an up-to-date warehousing system, furnished with highly productive equipment for transporting and reprocessing goods. Only then will we be able to obtain the necessary effect from using computer equipment.

It should also be noted that the supplier-enterprises are filling out the payment-account documents on standard, low-quality forms which have not been set up for processing on a computer. Thus, at the present time the republican computer center is receiving payment-account demands regarding metal products on more than 30 different forms. This substantially increases the time

periods and the outlays spent on their machine-processing. To eliminate these shortcomings, to retool the existing enterprises engaged in delivering products, and to bring the organization of material-and-technical supply into full accord with the requirements of the economy--such is the top-priority task of the supply organs.

The introduction of automated systems and the improvement of the administration of material-and-technical supply with the aid of computers is significantly increasing the effectiveness of providing the national economy with material resources and will facilitate a more effective use of them. This will be the guarantee of the successful fulfillment of the state plan by all the sectors of the economy, as well as the decisions of the 26th party congress and the ensuing Plenums of the CPSU Central Committee.

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